ESSENTIAL DIABETES MELLITUS CARE GUIDELINES

REVISED EDITION

DIABETES

CONTROL IS PREVENTION

DEVELOPED BY

THE WISCONSIN DIABETES ADVISORY GROUP

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Wisconsin Diabetes Control Program

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Essential Diabetes Mellitus Care Guidelines

Purpose

Diabetes is a serious, common, costly, but controllable disease affecting over 330,000 people in Wisconsin. People with diabetes are at increased risk of numerous complications, including blindness, kidney disease, foot and leg amputations, heart disease, stroke, and oral infections, including periodontal diseases. Many of these adverse outcomes can be prevented, or at least delayed, by an aggressive program of more preventive care, prompt identification of problems, early intervention and treatment. Although we have clinically proven methods to improve health outcomes, current studies show that people with diabetes do not receive recommended levels of preventive care. National figures show that there are wide gaps between current recommendations and actual practice due to a variety of attitudinal, educational, and systematic barriers. There are many opportunities to improve care and enhance quality of life for people with diabetes. The adoption of locally developed guidelines provides one viable opportunity to improve care and is a growing feature in many health care practices. Quality improvement initiatives offer another promising strategy to make dramatic improvements in overall health outcomes.

These Essential Diabetes Mellitus Care Guidelines, originally published in 1998, were recently revised to incorporate the latest scientific evidence regarding good diabetes care. They are the products of a collaborative effort of the Wisconsin Diabetes Advisory Group, a committee of over 55 key stakeholders in diabetes care. The target audience for the guidelines includes primary care providers and health systems (e.g., managed care organizations, other insurers, clinics, purchasers, etc.). Based on clinical trials, accepted science and expert opinion, the guidelines provide a concise, general framework for the prevention of diabetic complications. They will be reviewed periodically and revised to reflect advances in research and medical knowledge. The guidelines are designed to serve as convenient tools to support and influence provider decisions, as well as reminders to provide consistent, comprehensive preventive care. They include key measures and procedures that have the greatest potential to improve care system-wide. The guidelines are population-based, intended to be appropriate for *most* people with diabetes, but not intended to delineate the *sum total* or optimal level of care that an *individual* patient may need. Clinical judgment may indicate the need for adjustments appropriate to the needs of each particular patient (e.g., age, overall medical condition, or level of glycemic control). Supporting documents provide a quick guide of pertinent information and references for each key area. Implementation tools and the new Frequently Asked Questions (FAQ) section can help providers integrate the guidelines into everyday practice. A wallet card version of the guidelines is available for patients to help promote proactive care, enhance personal responsibility, and promote more active involvement in self-care management.

The companion Continuous Quality Improvement (CQI) Guidelines -- Diabetes Mellitus tool is designed to help integrate the guidelines into ongoing clinical practice activities of the health system. Adoption of the CQI tool can provide a standardized method to promote improved patterns of health care by measuring population-based indicators to monitor diabetes care system-wide. CQI can help us understand the root causes of sub-optimal care and identify potential solutions to achieve performance goals and avoid preventable, adverse health outcomes. Along with the opportunity for better care, quality improvement initiatives also offer the potential for eventual savings of time and money through improved systems for delivery of care. Data can be used to influence policy makers to reorganize office systems, support practice redesign strategies, target resources, promote accountability, evaluate health outcomes and interventions, and enhance partnerships among providers, plans, purchasers, and patients.

Providers and health care systems are encouraged to voluntarily adopt all or part of these guidelines as part of their continuous and systematic quality improvement activities.

Essential Diabetes Mellitus Care Guidelines
2001

Summary of Revisions

The Wisconsin Diabetes Advisory Group updated the Essential Diabetes Mellitus Care Guidelines (first published in March 1998) to incorporate recent diabetes-related research findings from the United Kingdom Prospective Diabetes Study (UKPDS), the Heart Outcomes Prevention Evaluation Study (HOPE), the Veterans Affairs High-Density Lipoprotein Cholesterol Intervention Trial Study (VA-HIT), as well as other research.

New Essential Diabetes Mellitus Care Guideline sections for 2001 include:

- Oral Health Care
- Gestational Diabetes (in the pregnancy supporting document)
- Frequently Asked Questions (FAQ) about the Guidelines

Additional implementation tools include:

- Criteria for diagnosis and testing for diabetes
- Updated flow sheets
- Information on measurement of body mass index in adults and children
- An Oral Health Screening Tool for primary care providers
- A Diabetes Eye Exam Consultation Form to communication eye exam results back to the PCP
- Feet Can Last a Lifetime resources (screening tool, foot exam posters, foot stickers)
- A list of depression screening resources

Other guideline modifications include:

- Added emphasis for aggressive glycemic, blood pressure and lipid control
- Clarification of screening for kidney function
- Reference to new smoking cessation guidelines
- Added emphasis on physical activity
- Provision for alternate year dilated eye exams, but only under specific circumstances
- Revised self-management training curriculum (and flow sheet)

Essential Diabetes Mellitus Care Guidelines - Wisconsin

Care is a partnership between the patient, family, and the diabetes team:
primary care provider, diabetes educator, nurse, dietitian, pharmacist and other specialists.

Abnormal physical or lab findings should result in appropriate interventions.

For particular details and references for each specific area, please refer to the supporting documents and implementation tools in the full-text guideline available via the Internet at **http://www.dhfs.state.wi.us/health/diabetes/DBMCGuidelns.htm** or call (608) 261-6871.

Concerns	Care/ Test	Frequency
General Recommendations	• Diabetes focused visit..... • Review management plan, problems & goals…….. • Assess Physical Activity/Diet/Weight-BMI/Growth…….	*Type 1**: every 3 months *Type 2**: every 3 - 6 months * or > often based on control & complications Each focused visit; revise as needed Each focused visit
Glycemic Control	• Review meds & frequency of low blood sugar..... • Self blood glucose monitoring, set & review goals..... • HbA1C - [goal: < 7.0% or ≤ 1% above lab norms].....	Each focused visit 2 - 4 times/day or as recommended Every 3 - 6 months
Kidney Function	• Urine for microalbumin: [if **higher** than 30 mcg/mg creatinine or > 30 mg/24 hours, initiate ACE inhibitor (unless contraindicated)] • Creatinine clearance & protein…… • Urinalysis.....	*Type 1:* Begin with puberty or after 5 yrs' duration, then yearly *Type 2:* At diagnosis, then yearly Yearly, after microalbuminuria > 300mg/24 hour At diagnosis and as indicated
Cardiovascular	• Smoking status..... • Lipid profile…… Adult goals**:** Triglycerides <200 mg/dl HDL >45 mg/dl LDL <100 mg/dl (optimal goal) • Blood pressure ..... Goals [**adult:** < 130/80] [If evidence of diabetic nephropathy, goal <125/75] [**peds:** below 90% of ideal for age] • Aspirin prophylaxis (unless contraindicated).....	Assess each visit; if smoker, counsel to stop; refer to cessation *Children:* If > 2 years, after diagnosis & once glycemic control is established - repeat yearly if abnormal. Follow National Cholesterol Education Program (NCEP) guidelines. *Adults:* yearly. If abnormal, follow NCEP guidelines. Each focused visit Age > 40 years
Eye Care	• Dilated eye exam by an ophthalmologist or optometrist	*Type 1*: If age >10 yrs, within 3-5 yrs of onset, then yearly *Type 2*: At diagnosis, then yearly or in alternate years at the discretion of the ophthalmologist or optometrist
Oral Health	• Oral health screening……..	Each focused visit; if dentate, refer for dental exam every 6 months (every 12 months if edentate)
Foot Care	• Inspect feet, with shoes and socks off..... • Comprehensive lower extremity exam.....	Each focused visit: stress need for daily self-exam Yearly
Pregnancy	• Assess contraception/discuss family planning/assess medications for teratogenicity • Preconception consult.....	At diagnosis & yearly during childbearing years 3 - 4 months prior to conception
Self Management Training	By diabetes educator, preferably a CDE • Curriculum to include the 10 key areas of the national standards for diabetes self-management education	At diagnosis, then every 6 - 12 months or more as indicated by the patient's status
Medical Nutrition Therapy	By a registered dietitian, preferably a CDE • To include areas defined by the American Dietetic Association's Nutrition Practice Guidelines	*Type 1**: At diagnosis, then, if age <18 years, every 3 - 6 months. If age >18 years, every 6 - 12 months *Type 2**: At diagnosis, then every 6 - 12 months; * Or > often as indicated by the patient's status.
Immunizations	• Influenza ..... • Pneumococcal……..	Per ACIP (Advisory Committee on Immunization Practices) Per ACIP

These guidelines were developed to provide guidance to primary care providers and are not intended to replace or preclude clinical judgement.

Patient Flow Sheet/Chart Audit Tool - Diabetes Mellitus

Patient Name _____ ID _____ Birthdate _____/_____/_____

Type of Diabetes:___ Type 1 ___ Type 2 ___ Gestational ___ Other Date of Diagnosis: _____/_____/_____ Home Glucose Monitoring: ___Yes ___No

Treatment: (check all that apply)_____Insulin _____Insulin & Oral Meds _____Oral Meds _____Diet _____ Physical Activity

Instructions: Please indicate <u>date of exam/test</u>, "A" for abnormal or "N" for normal <u>and the actual results</u>, when appropriate (eg. lab value), "D" if done elsewhere, and "R" if referred. Additional explanations should be written in the patient's clinical notes.

General Office Visits	date/results	date/results	date/results	date/results	date/results	Date/results
Review management plan *Type 1:* every 3 months *Type 2:* every 3-6 months						
Review physical activity *each visit*						
Weight						
Height						
BMI						
Glycemic Control						
HbA1c test *every 3-6 months*						
Review HbA1c target goal *Every visit*						
Kidney Function						
Microalbuminuria *Type 1: begin with puberty or after 5 yrs duration, then yearly Type 2: at dx, then yearly*						
Creatinine clearance & protein *yearly after microalbumin >300mg/24 hrs.*						
ACE inhibitor therapy *if indicated*						
Cardiovascular						
Smoking status *each visit*						
Advised to quit smoking *each visit*						
Smoking cessation referral *If indicated*						
Lipid Profile *Children > age 2 yrs, after dx when in glycemic control; Adults: yearly*						
TG						
HDL						
LDL						
Blood pressure *each visit*						
Aspirin therapy *if indicated*						
Eye Care						
Dilated eye exam *Type 1: if age > 10 years, within 3-5years of onset, then yearly Type 2: At diagnosis then yearly*						
Oral Health Care						
Oral health screening *each visit*						
Refer to dentist *every 6 months*						
Foot Care						
Inspect bare feet & stress self-exam *each visit*						
Comprehensive lower Extremity exam *yearly*						
Pregnancy						
Assess contraception/discuss family planning/assess meds for teratogenicity *at diagnosis and yearly during childbearing years*						
Preconception consult *3-4months prior to conception*						
Self Management Training						
At diagnosis, then every 6-12 months or more as indicated by the patient's status						
Medical Nutrition Therapy						
At diagnosis, then, Type 1: age <18, every 3-6 mos; age 18+, every 6-12 mos. or > as indicated *Type 2:* every 6-12 months or > as indicated						
Immunizations						
Influenza *yearly*						
Pneumococcal						

Supporting Documents

Section 1: General Recommendations

Diabetes mellitus is a serious disease and a major public health problem**.** The major morbidity, mortality, and economic burden of diabetes is associated with its complications. Both type 1 and type 2 diabetes can lead to devastating complications, such as blindness, end-stage renal disease, amputations, heart disease or stroke. The exciting news is that we now have a better understanding of diabetes and how to prevent or delay its complications, more management strategies, and new medications to treat the disease. Prevention, early detection, and aggressive treatment can have a significant impact on the quality of life for people who have this disease.

The Diabetes Control and Complications Trial (DCCT) showed that keeping blood glucose levels as close to normal as possible can slow the onset and progression of retinopathy, nephropathy, and neuropathy caused by type1 diabetes. It also demonstrated that *any* sustained lowering of blood glucose is beneficial, even if the person has a history of poor control. The enhanced management of this trial showed the value of a physician-coordinated team approach to a complex, chronic disease, with emphasis on preventive care, education, intensive monitoring, increased intervention, frequent follow-up, and access to consultation with specialists, such as endocrinologists, ophthalmologists, podiatrists, and dentists.

The United Kingdom Prospective Diabetes Study (UKPDS), a large prospective study of newly diagnosed patients with type 2 diabetes mellitus, showed significant reduction in microvascular disease with intensive control of blood glucose. Additional data from this study showed that treatment of blood pressure also reduced microvascular complications, congestive heart failure (CHF) and cardiovascular accident (CVA) risk. Of further importance is the data from this study showing that nearly 50% of patients at diagnosis had one or more complications of diabetes, emphasizing the need for early diagnosis and treatment of diabetes mellitus.

No one single practitioner is expected to provide all of the care the patient requires. The combined efforts of a team, along with regular, frequent follow-up are beneficial to achieve and maintain overall diabetes management. Recommended core members for the team include the primary care provider (PCP), dietitian, and nurse educator. The patient functions as the central member of the team. Depending on the need and availability, the services of other members, such as pharmacists, exercise physiologists, social workers, counselors, as well as specialists (podiatrists, ophthalmologists, optometrists, endocrinologists, nephrologists, cardiologists, dentists, and others) may be necessary. Each team member should have a special interest and experience with diabetes. In areas where it is impractical to develop a team, it may be beneficial to develop a system for ongoing consultation and/or to make referrals for these essential services. Diabetes management for children and adolescents should be provided by health care providers with expertise in meeting their special medical, educational, nutritional, and behavioral needs.

Diabetes-Focused Visit and Frequency

A diabetes-focused visit is one that is regularly scheduled for the primary purpose of diabetes management. The frequency of visits depends on the type of diabetes, blood glucose goals and the degree to which they are achieved, changes in the treatment plan, and the presence of complications or other medical conditions. An incidental, acute care visit for another health care need does *not* meet or fulfill the intent of a diabetes-focused visit.

Insulin treated patients should be seen at least quarterly and those who are non-insulin dependent should be seen quarterly or semiannually until treatment goals are achieved. Then, as long as the patient continues to achieve all treatment goals, the frequency of visits may vary. People with both type 1 and type 2 diabetes should be seen more often if indicated because of concerns with diabetes control,

complications, or other co-morbid conditions. Abnormal physical or lab findings should result in appropriate referrals and/or interventions.

Management Plan

The major management goal for diabetes is to achieve optimal metabolic control to prevent acute and chronic complications. The management plan should be reviewed at each diabetes-focused visit to determine the patient's current overall status, assess short and long term goals and identify problems.

This review should include the following, as needed: medications, control of blood glucose levels, frequency & severity of hypoglycemia, self-monitoring blood glucose (SMBG) results, assessment of complications, control of blood pressure and dyslipidemia, nutrition, weight, physical activity, eye exam, foot exam, oral exam, self-care management, adherence to the overall management plan, need for lifestyle changes, risk for falls or vision problems in the elderly, routine lab work and preventive exams, follow-up for referrals, when & how to contact the primary care provider and team, and psychosocial concerns (such as screening for depression). Patient knowledge of diabetes and self-management skills should be reviewed at least annually.

The management plan should be developed in collaboration with the patient, the family, the PCP, and other members of the health care team. Goals should be realistic, achievable, individualized and negotiated with each patient. Evaluation of the patient's management plan should be outcome driven, with success measured through metabolic parameters, such as SMBG results, hemoglobin A1c and lipid levels, body weight, blood pressure, and quality of life, as well as by the absence of complications, the reduced need for emergency services or reduced levels of medication.

Physical Activity

Physical activity is essential for good diabetes control. Benefits of regular physical activity include improved glucose control, increased insulin sensitivity, decreased cardiovascular risk factors (such as hypertension and hyperlipidemia), more effective weight management, improved physical endurance and reduced stress. Unless contraindicated, physical activity should be done as prescribed on a regular basis. A safe physical activity prescription should be based on medical evaluation and include individualized guidelines for managing a safe physical activity program. Evaluation for any underlying complications affecting the eyes, heart and blood vessels, kidney, or nervous system should be done prior to initiation of any physical activity program.

Diet/Weight/BMI/Growth

Medical nutrition therapy must be individualized to achieve specific metabolic goals and provide optimal nutrition. Patients with type 1 diabetes need to integrate insulin into their usual eating and physical activity patterns, with attention to prevention of hypoglycemia. Adults and children should be weighed at every visit and body mass index, BMI, the measurement of choice to determine health risks due to overweight, should be periodically assessed. BMI is a mathematical formula (ratio between height and weight) that correlates with body fat and is a better predictor of disease risk than body weight alone. BMI is the body weight (in kg) divided by height (in $m^{2)}$. For adults, a BMI $\geq$ 25 denotes overweight and a BMI $\geq$ 30 denotes obesity. A sample BMI chart for adults is included in the guideline-appendix. Current charts are not appropriate for frail or sedentary elderly individuals, women who are pregnant or lactating, or competitive athletes or body builders. Adequate calories should be provided to facilitate normal growth and development for children and adolescents. Their height and weight should be assessed at every visit and regularly plotted on standardized growth charts. Information about growth and BMI charts for children and adolescents is included in the appendix**.**

About 80% of patients with type 2 diabetes are overweight. Weight loss in overweight people with diabetes can improve both hypertension and blood glucose control. Studies have shown that even modest reductions in weight (10 pounds) can be beneficial. Modest calorie restriction and modification in eating habits, physical activity and ongoing support can help patients achieve weight loss. Emphasis should be on attaining reasonable body weight, defined as the weight that an individual and provider feel to be achievable and maintainable. Referrals to dietitians, diabetes educators, physical therapists, and/or exercise physiologists may be beneficial for problem-solving and ongoing support to achieve physical activity, dietary and weight goals.

Coordination of Care

Referrals to specialty services for co-management and consultation should be made in a timely manner when indicated by the patient's status. Ongoing communication among all professionals involved in treating the patient is essential to ensure optimal diabetes management.

Essential Patient Education

All patients with diabetes mellitus should be fully informed of the need for good diabetes management and the prevention of complications. Culturally appropriate approaches and materials should be used as needed. Education should include, but not be limited to, the following:

- Diabetes mellitus is a serious disease.
- Many complications can be prevented.
- Ongoing management visits and preventive care are necessary.
- Patient adherence with recommended referrals (e.g., routine dental care, foot care, eye exam, and other specialty care) is essential for overall diabetes management.
- Early detection and treatment of problems is crucial.
- Lifestyle choices impact greatly on overall diabetes control.
- Goals determined jointly by the patient and PCP are essential to achievement of positive outcomes.
- Assistance and support to help patients manage their diabetes are available.
- Diabetes is primarily self-care, making the patient the key player in control.

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Section 2: Glycemic Control

The Diabetes Control and Complications Trial (DCCT) revealed the significant impact of intensive treatment, leading to reduced levels of blood glucose on the reduction of risk for retinopathy, nephropathy, and neuropathy for patients with type 1 diabetes. For each 2% decrease in HbA1c, there was a 50-75% reduction in complications. Although this trial promoted "tight" control to achieve desired results, reduction in risk was noted even when blood glucose was not reduced to normal levels. Although tight control is not appropriate for all patients, all patients are candidates for *better* control. Any improvement in glycemic control should help to decrease the risk of these complications.

"The largest and longest study of patients with type 2 diabetes, the United Kingdom Prospective Diabetes Study (UKPDS), conclusively demonstrated that improved blood glucose control in these patients reduces the risk of developing retinopathy and nephropathy and possibly reduces neuropathy. The overall microvascular complication rate was decreased by 25% in patients receiving intensive therapy versus conventional therapy. Epidemiological analysis of the UKPDS data showed a continuous relationship between the risk of microvascular complications and glycemia, such that for every percentage point decrease in HbA1c there was a 35% reduction in the risk of microvascular complications." (quote from #2)

Good glycemic control has also been shown to be cost-effective as well as to improve quality of life. Although intensive control of glucose in patients with type 1 or type 2 diabetes initially costs more, the expected decreases in both acute and chronic complications of the disease makes this strategy cost-effective in the long term. For example, decreasing the HbA1c 1% can decrease hospitalizations by 14-20%, resulting in $4-5 billion savings in direct health care costs alone.

Optimal treatment should be offered to all patients. Glycemic goals should be achievable, realistic, and individualized for every patient. Specific goals may need to be adjusted for special needs, such as the patient's age (children and the elderly), severe or frequent hypoglycemia, lifestyle factors, co-morbid conditions, self-management skills and motivation. All goals should be mutually agreed upon by the patient, family, and health care providers.

American Diabetes Association: Goals for glycemic control for people with diabetes*

	Normal Goal	Additional Action Suggested	
Whole blood values			
Average pre-prandial glucose (mg/dl) †	<110	80-120	<80/>140
Average bedtime glucose (mg/dl) †	<110	100-140	<100/>160
Plasma values			
Average pre-prandial glucose (mg/dl) ‡	<110	90-130	<90/>150
Average bedtime glucose (mg/dl) ‡	<120	110-150	<110/>180
HbA1c	<6	<7	>8

The values shown in this table are by necessity generalized to the entire population of individuals with diabetes. Patients with co-morbid diseases, the very young and older adults, and others with unusual conditions or circumstances may warrant different treatment goals. These values are for non-pregnant adults. "Additional action suggested" depends on individual patient circumstances. Such actions may include enhanced diabetes self-management education, co-management with a diabetes team, referral to an endocrinologist, change in pharmacological therapy, initiation of or increase in SMBG, or more frequent contact with the patient. HbA1c is referenced to a non-diabetic range of 4.0%-6.0% (mean 5.0%, SD 0.5%).

The symbol † refers to measurement of capillary blood glucose. The symbol ‡ refers to values calibrated to plasma glucose.
** Source: American Diabetes Association, Standards of Medical Care for Patients with Diabetes Mellitus, Diabetes Care, 24 (supp1), 2001.*

Review Medications & Low Blood Glucose

A review of medications, compliance, side effects, or related problems should be done at every diabetes-focused visit. Frequency of low blood glucose episodes, specifically severe episodes requiring assistance, should be assessed. Patients should also be evaluated for hypoglycemic unawareness, the inability to recognize early warning signs of hypoglycemia. Glycemic goals may need to be adjusted for patients who experience frequent and/or severe hypoglycemia (defined as seizure, coma, or any disorientation or confusion requiring the assistance of another person), as well as for the special needs of children and the elderly. Patients should be taught the symptoms, causes, and treatment of hypoglycemia. Patients should be encouraged to wear or carry special identification (card or tag) in case of medical emergency. Since relatively mild hypoglycemia can impair driving performance, patients with type 1 diabetes should be counseled regarding safe driving practices commensurate with their risk for hypoglycemia. Family members of patients using insulin should be taught how to use glucagon.

Self-Monitoring of Blood Glucose

Self-monitoring of blood glucose (SMBG) is a powerful tool to help achieve active patient participation in self-management and achievement of overall diabetes control. Patients should be taught proper use of SMBG and the importance of maintaining a log. Blood glucose results can be used to guide care and make treatment adjustments, provide feedback on the impact of diet, physical activity and medication on overall control, and help reduce the risk of hyperglycemia and hypoglycemia. Providers need to be aware that some patients have blood glucose meters that give values calibrated to whole blood and others to plasma. Health care providers should discuss this while setting SMBG goals with the patient.

Most endocrinologists recommend SMBG for all patients with diabetes. SMBG is specifically recommended for patients on insulin and patients on hypoglycemic medication who are at risk for hypoglycemia. Testing is specifically useful for all patients during times of stress. ADA recommends that frequency of testing should be individualized according to specific clinical circumstances, specific treatment, and treatment response. Recommendations for testing for patients taking insulin are 2-4 times a day. Patients who are pregnant or on intensive therapy usually require more frequent testing. Results of SMBG should be reviewed at each diabetes-focused visit and used to assess control and self-management and to reinforce the importance of monitoring.

HbA1c Testing

Glycosolated hemoglobin testing is an accurate indication of long term glycemic control, showing the average blood glucose control over the previous 2- 3 month period. Frequency of testing should be dependent on the type of treatment and judgment of the provider. ADA recommends testing two times per year for those with stable glycemic control and quarterly in those whose therapy has changed, those whose treatment goals are not met, and those with poor glycemic control. Patients should be informed of the results and significance of their tests to assist with motivation and education for self-management. Since glycated hemoglobin values can vary in different laboratories, adjustment should be made to account for local differences in assay methodology and non-diabetic reference ranges. The glycated hemoglobin goal should be ≤1% above lab normal. For example, the HbA1c goal is < 7.0% when referenced to a non-diabetic range of 4.0% to 6.0%. Action is recommended for HbA1c > 8.0%.

Referral & Coordination of Care

Referrals to specialty services for co-management and consultation should be made in a timely manner when indicated by the patient's status. Ongoing communication among all professionals involved in treating the patient is essential to ensure optimal diabetes management.

Essential Patient Education

All patients with diabetes mellitus should be fully informed of the need for good diabetes management and the risks of poor glycemic control. Culturally appropriate approaches and materials should be used as needed. Education should include, but not be limited to, the following:

- Diet, medication, weight reduction, and physical activity are all related to glucose control.
- Guidelines for prevention and treatment of hypoglycemia and hyperglycemia should be provided.
- Patient should be taught how to manage sick days.
- The patient has primary responsibility for glucose control, goals and outcomes.
- SMBG and record keeping are important.
- Regular glycemic testing and follow-up are crucial.
- Patients should be informed of their own glycemic values and their significance.

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Section 3: Kidney Function

Diabetes mellitus is the leading cause of end-stage renal disease in the United States. Renal disease in diabetes mellitus is a progressive process influenced primarily by glycemic control and blood pressure. Early detection and intervention, along with improved glycemic control and blood pressure control, can help reduce the risk of development and progression of nephropathy. Screening for and treatment of diabetic nephropathy provides additional years of life and has been shown to be cost-effective in several studies.

Screening

Microalbuminuria (loss of small amounts of protein in the urine) is an important predictor of diabetic nephropathy, end stage renal disease and cardiovascular mortality. The recommended test for screening for early diabetic kidney disease is the urine microalbumin. Adults should be screened for microalbuminuria at the time of diagnosis and then annually. Because microalbuminuria seldom occurs with short duration of type 1 diabetes or before puberty, screening for these patients should begin with puberty and after 5 years' disease duration, whichever occurs first. More frequent screening may be indicated for certain groups, such as those with a family history of end-stage renal disease and/or hypertension, those with a history of chronically poor glycemic control and those of African American, Hispanic, or Native American heritage. A routine urinalysis is not sensitive enough to measure microalbuminuria, therefore a specific urine collection for microalbumin should be done.

Screening for microalbuminuria can be performed by several different methods which may have different normal ranges, according to the specific laboratory. Actual choice of screening test to use may depend on availability within individual laboratories. Screening tests may be done with a spot urine sample or a timed urine collection as shown in Table 1. A routine urinalysis with dipstick protein will only measure urine albumin over > 300 mg/dl and thus cannot be used for screening for early kidney disease. Since albumin excretion can vary, ADA recommends that at least 2 collections repeated in a 3-6 month period should be elevated before designating a patient as having microalbuminuria. Heavy exertion or physical activity within 24 hours, infection, fever, congestive heart failure, marked hyperglycemia, and uncontrolled hypertension may elevate urinary excretion over baseline values.

TABLE 1

Diagnosis	Non-Timed Urine Collections		Timed Urine Collections	
	Unadjusted	Adjusted for Urine Creatinine Concentration	Overnight	24 h
Normoalbuminuria	<20 mcg/ml	<30 mg/g (<30mcg/mg)	<20 mcg/min	<30mg/24 h
Microalbuminuria*	20 to 200 mcg/ml	30 to 300 mg/g (30-300 mcg/mg)	20 to 200 mcg/min	30 to 300 mg/24 h
Macroalbuminuria*	>200 mcg/ml	>300 mg/g (>30 mcg/mg)	>200 mcg/min	>300 mg/24 h

***In the absence of any other urine abnormality and urinary tract infection

Table modified from: Piero, et al, Nephropathy of type 2 diabetes mellitus, J Am Society of Nephrology, (9): 2157-2169, 1998

If microalbuminuria is present (see Table 1**)**, ACE inhibitor therapy should be started, unless contraindicated. Studies have shown that ACE inhibitor therapy is beneficial in reducing progression of microalbuminuria for both normotensive and hypertensive patients with type 1 and type 2 diabetes. ACE inhibitor therapy should **not** be used during pregnancy. If macroalbuminuria is present, testing for

creatinine clearance and protein should be done yearly. Without intervention, patients with albuminuria are at significant risk of progression to end-stage renal disease as well as increased risk of coronary heart disease. Appropriate treatment should be initiated. Treatment therapies may include: aggressive efforts to improve glycemic control, restriction of dietary protein, ACE inhibitor therapy, and aggressive management of hypertension, including pharmacological treatment and lifestyle modification.

A routine urinalysis should be obtained at diagnosis to assess for ketonuria, bacteriuria, and gross proteinuria. The urinalysis should be repeated as indicated in given patients (e.g. pregnancy, bladder atony, asymptomatic bacteriuria, etc.) As noted above, it is not useful as a screening tool for early detection of kidney disease.

Referral and Coordination of Care

Referrals to specialty services for co-management and consultation should be made in a timely manner when indicated by the patient's status. Consultation with a specialist (e.g. nephrologist and transplant medicine physician, if appropriate) should be made if the patient has more than 1gm protein per day or serum creatinine of 1.5mg/dl or greater, rapidly declining renal function**,** or hypertension unresponsive to treatment. Ongoing communication among all professionals involved in treating the patient is essential to ensure optimal diabetes management.

Essential Patient Education

All patients with diabetes mellitus should be fully informed of the risks of kidney disease, prevention strategies and options for treatment. Culturally appropriate approaches and materials should be used as needed. Education should include, but not be limited to, the following:

- Glycemic control is essential to prevent kidney disease**.**
- Annual kidney function testing and appropriate follow-up are necessary.
- Patients in early stages of decreased kidney function are typically asymptomatic.
- Hypertension plays a role in kidney disease.
- Control of hypertension is essential.
- Lifestyle modifications (weight loss, physical activity, decreased salt, smoking cessation, adequate but not excessive protein) are important in the control of hypertension.
- It is necessary for the patient to adhere to the overall management plan to avoid complications.
- Patients should know their current kidney function lab values and their significance.

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Section 4: Cardiovascular Health

Diabetes mellitus, smoking, hyperlipidemia, hypertension, obesity, and genetics are major risk factors for cardiovascular disease. Hypertension, which increases the risk of amputation, progression of kidney disease, and retinopathy, is twice as common in people with diabetes, and even higher in minority populations. Over 60% of patients with diabetes have hypertension and about 40% have lipid disorders. Cardiovascular disease is 2 to 4 times more common in people with diabetes and present in about 75% of diabetes-related deaths. Even in the absence of overt disease symptoms, patients with diabetes typically exhibit abnormal endothelial function and thickening of the vascular walls. It is essential for the physician and health care team to provide regular cardiovascular assessment, an aggressive approach to risk factor modification, and appropriate treatment interventions to prevent or decrease the risk of cardiovascular complications.

Smoking Cessation

Smoking is the leading cause of preventable disease and death. It is a major risk factor for coronary and peripheral vascular disease, cancer and chronic lung disease. Cessation is essential to reduce the risk of diabetes-related complications and other smoking related diseases. Health care providers should be trained to assess each patient's smoking status at every visit, advise smokers to quit, and provide support with cessation interventions. *Effective pharmacologic agents are now available and should be utilized to facilitate smoking cessation.* The U.S. Dept. of Health & Human Services, Public Health Service, developed guidelines for a systems approach to smoking cessation that outline effective and efficient strategies to reduce smoking. (website - http://www.surgeongeneral.gov/tobacco/)

Lipid Monitoring and Treatment

Diabetes is a common cause of secondary dyslipidemia. Because of the high risk for coronary artery disease (CAD) in patients with diabetes, monitoring and treatment of abnormal lipid levels are essential components of continuing medical care.

The most frequent pattern of dyslipidemia in patients with diabetes is a combined disorder characterized by elevated LDL-cholesterol, elevated triglycerides, and reduced HDL-cholesterol. In newly discovered diabetes, attainment of optimum glycemic control using behavioral and pharmacologic treatment may provide significant improvement in triglyceride and HDL levels. Nutritional therapy, physical activity, and weight loss have similar benefits for glycemic control and for the dyslipidemia which occurs in diabetes.

Pharmacologic therapy should be initiated if behavioral and glycemic drug therapy are not successful in lowering lipid levels to recommended therapeutic values (Table 1). In patients with established CAD or with very high LDL-cholesterol levels (>200 mg/dl) pharmacologic therapy should be started in conjunction with behavioral modifications.

The "statin" class of drugs has proven to be the most effective pharmacologic agents for reduction of LDL-cholesterol. Recent clinical trials have also demonstrated a significant reduction in cardiovascular events in patients with diabetes treated with statins. However, many patients with diabetes may require a combination of lipid lowering agents to achieve optimum correction of more complex dyslipidemias. Both the American Heart Association and the American Diabetes Association provide detailed guidelines for pharmacologic treatment of lipid abnormalities.

Table 1. Lipid Therapy Goals for Adults with Diabetes*

LDL-Cholesterol	**< 100 mg/dl**
HDL-Cholesterol	**> 45 mg/dl**
Triglycerides	**< 200 mg/dl**

*Source American Heart Association Scientific Statement. Diabetes and Cardiovascular Disease. *Circulation* 100: 1134-1146, 1999.

A team approach, utilizing diabetes educators and dietitians, can be beneficial to provide the ongoing education, motivation, support and follow-up to help patients achieve and maintain the lifestyle changes necessary to achieve optimal lipid levels and glycemic control. Consultation with specialists in lipid management may also be indicated for patients with more complex dyslipidemias or who are not optimally responsive to conventional therapy.

In patients who have achieved satisfactory lipid levels, annual fasting lipid profiles should be obtained. Patients in whom glycemic control has worsened may also require re-evaluation of lipid values.

Children over the age of 2 years should have lipids tested after the diagnosis of diabetes and once reasonable glycemic control has been established. If values are acceptable, testing should be repeated at least every 5 years. Borderline or abnormal values should be repeated for confirmation. Annual testing should be done if abnormalities are identified. Abnormal values requiring therapy should follow the NCEP recommendations. Specialists should be consulted for the special treatment of lipid disorders in children.

Blood Pressure

It is now recommended that patients with diabetes receive aggressive evaluation and treatment of blood pressure to achieve levels of 130/80 or lower. If the patient has diabetic nephropathy, an appropriate blood pressure goal may be <125/75. Blood pressure should be measured at every visit to assure achievement of a consistent level of control. Lifestyle modification, including weight management, diet (salt reduction), moderation of alcohol intake, increased physical activity and smoking cessation is the cornerstone of therapy. Lifestyle modification may even enable patients on drug therapy to reduce medication required to manage hypertension and diabetes. Appropriate drug treatment should be initiated when necessary to achieve control. Due to their beneficial effect on reducing cardiovascular events and deterioration of renal function, ACE inhibitors should be considered as an initial choice of treatment, unless contraindicated.

Multi-drug regimens are frequently required to achieve satisfactory blood pressure control. In some cases, judicious use of selective (beta-1) beta-blocking agents may be appropriate in patients with diabetes with known coronary artery disease (CAD), and especially after myocardial infarction.

Special references should be consulted for normal blood pressure values, goals and treatment of hypertension in children. Specialists with expertise in managing children with diabetes should be consulted as needed.

Aspirin Prophylaxis

Aspirin prophylaxis has been shown to be beneficial for patients with diabetes and cardiovascular or cerebrovascular disease. There is no known evidence that prophylactic aspirin therapy increases retinopathy or vitreal hemorrhage. Unless contraindicated, aspirin prophylaxis is generally recommended for patients with diabetes over the age of 40 years. Depending on individual disease status, aspirin therapy may also be beneficial for younger patients. For example, beginning aspirin therapy at age 30 years for patients with long-standing type 1 diabetes may be prudent. In patients with established CAD the combination of ACE inhibitors and aspirin may be less effective in preventing secondary cardiovascular events. Specialists, such as cardiologists or endocrinologists, should be consulted for special recommendations under these circumstances.

Baseline Electrocardiogram (ECG) and Diagnostic Stress Testing

The need for routine baseline ECG studies or exercise testing for asymptomatic patients with diabetes should be based on individualized risk factor assessment and likelihood of identifying underlying cardiovascular disease. It should be emphasized that baseline ECG abnormalities may occur with a similar frequency pattern in adult patients > age 40 years who have type 2 diabetes (13-20%), glucose intolerance (12-13%), and in normal subjects (8-12%). In addition, the specificity of baseline ST-T abnormalities for underlying CAD in patients with diabetes is adversely influenced by the frequent occurrence of hypertension and microvascular diabetic cardiomyopathy which also produce ST-T repolarization abnormalities similar to ischemia. These limitations may necessitate further noninvasive studies to rule out falsely positive baseline ECG results.

Routine diagnostic stress testing is not necessary for non-symptomatic patients with diabetes who have *well-controlled risk factors.* Diagnostic stress testing (with or without combined imaging) should be considered for higher risk patients with diabetes prior to starting an exercise training program. Prior to major surgery all patients with diabetes with multiple risk factors should be evaluated with diagnostic exercise testing or pharmacologic stress combined with radionuclide or echocardiographic imaging.

Antioxidant Dietary Supplements

Oxidative stress is generally believed to play an important role in the initiation and progression of vascular disease. Dietary antioxidants, e.g., vitamins A, C, E, have been recommended to reduce the impact of oxidative stress. However, a recent large scale study failed to demonstrate a significant benefit for vitamin E supplementation in patients with diabetes. Additional studies may be necessary to clarify these unexpected findings. Dietary recommendations for patients with diabetes should continue to emphasize the consumption of a variety of fruits, vegetables and whole grains to assure adequate intake of natural source antioxidants.

Referral and Coordination of Care

Referrals to specialty services for co-management and consultation should be made in a timely manner when indicated by the patient's status. Ongoing communication among all professionals involved in treating the patient is essential to ensure optimal diabetes management.

Essential Patient Education

All patients with diabetes mellitus should be fully informed of the risks of diabetes and heart disease, prevention strategies and options for treatment. Culturally appropriate approaches and materials should be used as needed. Education should include, but not be limited to, the following:

- Smoking, inactivity, obesity, poor diet, hypertension, and hyperlipidemia are all significant risk factors related to overall cardiovascular and diabetes control.
- It is essential to modify controllable risk factors.
- Regular monitoring of blood pressure, lipids, and weight is important.

- It is necessary to take medication as ordered and to follow an individualized diabetes management plan.
- Patients should be informed of the significance and results of lab tests and blood pressure readings.

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Section 5: Eye Care

Dilated eye exams are essential for the early detection of blinding diabetic eye disease. Diabetes mellitus is a leading cause of blindness for adults up to 74 years. Studies have shown that early detection and proper treatment can reduce the risk of diabetic retinopathy and blindness by 50-60% (ETDRS/DRS). In addition, proper glycemic control can reduce the risk of progression of retinopathy by 34-76%. The DCCT revealed the significant impact of intensive treatment, leading to reduced levels of blood glucose on the reduction of risk for retinopathy, nephropathy, and neuropathy for patients with type 1 diabetes. For each 2% decrease in HbA1c, there was a 50-75% reduction in complications. Epidemiological analysis of the UKPDS, the largest and longest study of patients with type 2 diabetes, showed a continuous relationship between the risk of microvascular complications and glycemia, such that for every one percentage point decrease in HbA1c there was a 35% reduction in the risk of microvascular complications. Not only do diabetic retinopathy screening and treatment programs result in increases in person-years of sight, but they also have been shown to be clearly cost-saving interventions.

Frequency, Qualified Provider, & Referral

Patients with type 2 diabetes should receive a *dilated* eye exam at diagnosis, then yearly. Patients with type 1 diabetes should have an initial *dilated* eye exam within 3-5 years after onset of diabetes or age 10 years, whichever comes later, then every year.

Two exceptions to the annual *dilated* eye exam may be allowed at the discretion of the ophthalmologist or optometrist:

1. Annual screening is generally not indicated for patients with type 1 diabetes within the first 3 to 5 years after diagnosis or before the age of 10 years, which ever occurs later.
2. Patients with type 2 diabetes who meet **ALL** of the following requirements:
   - Recent and ongoing HbA_{1c} levels which are within 1% of normal for a given lab (this implies measured within the last 6 months)
   - Consistent blood pressure at or below 130/80 mmHg
   - A dilated eye exam within the past year which revealed no retinopathy

An optometrist or ophthalmologist who is fully trained in recognizing diabetic retinopathy should provide these eye exams. Abnormal findings should result in either prompt treatment or timely referral for the management of diabetic retinopathy, when indicated. Any patient with persistent visual complaints should be referred more frequently.

Coordination of Care

It is necessary that the optometrist or ophthalmologist communicate the results and recommendations of each eye exam to the patient's primary care provider, as well as to the individual patient. It would be beneficial if the primary care provider would provide the eye care specialist with the patient's current HbA1c and blood pressure values.

Essential Patient Education

All patients with diabetes mellitus should be fully informed of the risks of eye disease, prevention strategies and options for treatment. Culturally appropriate approaches and materials should be used as needed. Education should include, but not be limited to, the following:

- Variable loss of vision is a known complication of diabetes.
- Regular, dilated eye exams are necessary to prevent loss of vision.
- It should be stressed to the patient that by no means is an eye (vision) screening an alternative to the yearly dilated eye exam.
- Retinopathy often shows no symptoms until fairly advanced stages of disease.

- Early detection and timely, appropriate treatment significantly reduce the risk of vision loss.
- Other aspects of diabetes management can affect retinopathy, such as poor glycemic control, hypertension and elevated lipids.
- Diligent glycemic control can reduce the risk of onset or progression of diabetic retinopathy by 35 to 75%.
- Patients should be made aware of vision-threatening symptoms that should be reported immediately. (e.g., floaters, shadows, or persistent blurred vision).
- Diabetic retinopathy may accelerate during pregnancy. A baseline dilated comprehensive eye exam is necessary BEFORE conception, and women should be counseled on the risk of development and/or progression of retinopathy. This risk is present up to 1 year after childbirth.
- Patients with low vision should be given information about the availability of resources and support for the visually impaired.

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Section 6: Oral Health Care

People with diabetes are more susceptible to oral infections, including periodontal disease, especially during periods of poor diabetic control, and the presence of active periodontitis can in turn impair glycemic control. Additionally, the presence of periodontitis can increase the risk for development of systemic complications of diabetes, especially cardiovascular disease and stroke. Pre-term low birth weight delivery may be an additional health concern for women with diabetes because of their increased risk for periodontitis. The negative outcomes of periodontitis for diabetes, such as impaired glycemic control and tooth loss, can be avoided through screening, referral and treatment for periodontitis. It is essential that people with diabetes receive oral health screenings on a regular basis and are referred to a dentist or dental specialist for diagnosis and treatment as appropriate.

Routine Oral and Dental Care

Dentate patients (having teeth) with diabetes should receive an evaluation of the oral cavity for signs of redness, bleeding, halitosis, accumulation of debris around the teeth, gingival recession with exposed root surfaces, and tooth mobility during routine diabetes-focused visits. Edentulous patients (lacking teeth) should also receive an evaluation for signs of tissue inflammation or irregularities, as well as white or red lesions. This evaluation can be performed by physicians, nurses, ancillary healthcare professionals, and caregivers. A sample oral health screening tool, which may be helpful to guide the evaluation, is included in the guideline appendix. Any positive findings should initiate referral to a dental provider. In the absence of positive findings, patients should receive an assessment by a dental provider every six months for dentate patients, every 12 months for edentulous patients and more frequently if problems exist.

Referral and Coordination of Care

The dentist should be recognized as an integral member of the diabetes care team. Ongoing communication between the diabetes team and the dentist is essential to ensure optimal glycemic control and good diabetes management. Referrals and consultation for dental services should be considered a routine part of complete diabetes care. Referrals to a general dentist or periodontal specialist for oral health evaluation should be made whenever more than six months have passed since the most recent evaluation for dentate patients, 12 months for edentulous patients, and more frequently whenever an oral screening indicates any signs of oral problems. Standard dental care may include oral and dental examination, to include complete periodontal examination, non-surgical and/or surgical periodontal therapy with adjunctive antibiotics, rigorous oral hygiene instruction to patient and all caregivers, and frequent dental recall to control disease.

Essential Patient Education

All patients with diabetes mellitus should be fully informed of the risks of oral infections and periodontal diseases. Culturally appropriate approaches and materials should be used as needed. Education should include, but not be limited to, the following:

- People with diabetes are at increased risk for oral infections, including periodontal disease.
- Oral infections can be life threatening for people who have diabetes.
- The prevalence and severity of periodontal disease is greater among persons with diabetes, and correlates with increasing duration of diabetes.
- Periodontal disease may lead to dental amputation, or tooth loss, and is a serious complication of diabetes that can be prevented.
- Ongoing dental care is essential to maintain good diabetes control and oral health.
- It is essential for patients to inform their dentist or dental hygienist that they have diabetes.
- Since periodontal disease is often asymptomatic and best treated in its earliest stages, regular dental consultation, professional care and self-care are essential.

- Keys to preventing oral infections, including periodontal disease, include good glycemic control, control of serum lipids, good oral hygiene, and regular dental care.
- Tobacco cessation is essential for good oral health, since all forms of tobacco use increase the risk of developing periodontal disease.
- Periodontal disease may decrease the effectiveness of diabetic medications.
- Periodontal disease is a significant risk factor for the systemic diabetic complications of cardiovascular disease and stroke.
- Pre-term low birth weight delivery may be an additional health concern for women with diabetes because of their increased risk for periodontitis.

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Section 7: Foot Care

Diabetes mellitus is the major cause of non-traumatic lower-limb amputation in the United States. Estimates predict that at least 50% of these amputations can be prevented with proper foot care. Diabetes causes sensory neuropathy, resulting in loss of protective sensation, ischemia and reduced resistance to infection. The combination of sensory deficits plus peripheral vascular disease puts the patient at high risk for foot complications. Foot disease is the most common complication of diabetes necessitating hospitalization. Simple techniques, such as identification of patients at risk for foot problems and careful monitoring on a regular basis, along with education of patients about proper foot care and glucose control are keys to reduce or prevent complications. Prompt and aggressive intervention for any identified foot problem is essential. The cost-effectiveness of routine foot care provided in a multi-disciplinary setting has been evident in several studies, demonstrating a 50% reduction in lower leg amputations.

Routine Foot Care

All adult patients with diabetes mellitus should have their bare feet examined by a health professional at each diabetes-focused office visit. The exam should include a visual inspection for the presence of skin lesions, calluses, infections, discoloration, deformity, or other signs of problems. Patients should be instructed to inspect their feet daily and educated in appropriate foot care, use of protective footwear, how to care for foot problems and when to seek professional assistance. Special care and education strategies may be necessary to help people with visual and physical limitations. Family members or friends can be trained to assist the patient with daily foot care. All patients should be educated to expect and request routine foot exams at each diabetes-focused office visit.

Comprehensive Exam

All adult patients with diabetes should receive a comprehensive lower extremity exam annually, including vascular, neurological, musculoskeletal, and skin, nail and soft tissue evaluations. The comprehensive exam should test for protective sensation with use of a monofilament, identify patients at risk for foot problems and categorize their level of risk, identify current problems and changes since the last exam, identify abnormalities or deformities, assess foot and lower extremity pulses, assess gait and range of motion, and identify management needs and any necessary referrals. Ongoing, individualized patient education should be provided. Adoption of a comprehensive risk assessment tool, such as the Annual Comprehensive Diabetes Foot Exam Form (sample in appendix), can be beneficial to identify patients with loss of protective sensation, determine an initial course of action, develop a management plan, and serve as a baseline to compare with future screenings.

Qualified Provider

The foot exam should be performed by a qualified health professional with knowledge and experience in the care of diabetic foot problems.

Referral & Coordination of Care

When indicated, patients should be referred in a timely manner to specialists, such as podiatrists, orthopedic or vascular surgeons, footwear specialists, or rehabilitation specialists for co-management and consultation regarding foot care and treatment. Ongoing communication among all professionals involved in treating the patient is essential to ensure optimal diabetes management.

Essential Patient Education

All patients with diabetes mellitus should be fully informed of the risks of diabetic foot disease, prevention strategies and options for treatment. Culturally appropriate approaches and materials should be used as needed. Education should include, but not be limited to, the following:

- Good glycemic control is essential to prevent or minimize foot care problems.
- Smoking cessation is essential to decrease the risk of foot problems.
- Patients should be instructed in self-care of the feet, including proper footwear.
- Patients must check their feet daily, or if unable, ask a family member or friend to check.
- Patients should ask their health care provider to check their feet at every diabetes office visit.
- Patients should be told to obtain prompt treatment for foot problems as well as when and how to notify their health care provider.
- Every foot lesion, no matter how insignificant it appears, should be evaluated.
- It is essential for patients to follow recommendations and return for regular follow-up care.

Helpful Tools

Feet Can Last a Lifetime

Copy-ready masters of the Annual Comprehensive Diabetes Foot Exam, chart stickers, and exam room posters from the National Diabetes Education Program's (NDEP) Feet Can Last a Lifetime materials (a Health Care Provider's Guide to Preventing Diabetes Foot Problems), are included in the guideline appendix. A 12 page, easy-to-read illustrated patient booklet (Take Care of Your Feet for a Lifetime), providing step-by-step instructions for proper foot care, including a tear-off reminder sheet of foot care tips and a patient "To Do" list is available in English and Spanish. Copies of the health care provider kit and the patient booklet may be ordered from the National Diabetes Information Clearinghouse by calling 800-860-8747. You can also print or download the materials from NDEP's web-site http://ndep.nih.gov

Other useful tools include:

Diabetic Foot Disorders Clinical Practice Guidelines (Cost: $38 - To order, call the American College of Foot & Ankle Surgeons at 847-292-2237)

Referral Guidelines for Primary Care Physicians (to order, call the American Podiatric Medical Association, AV Department at 301-571-9200 ext. 277).

Training videos on Foot Assessment of the Adult Patient with Diabetes are available from the Lower Extremity Amputation Prevention (LEAP) Program at 888-275-4772 or 301-594-4424. The videos may also be viewed directly on their web-site, http://www.bphc.hrsa.gov/leap.

Video and tool kit "Performing foot exams to prevent lower extremity amputations in patients with diabetes" (Cost $5.91 per video or $11.15 for tool kit with video [includes shipping]; to order, call the Texas Medical Foundation at 888-691-9167 - ask for Jim Turpin)

Sensory testing monofilaments are available from:

- Lower Extremity Amputation Prevention (LEAP) Program (888-275-4772)
- The Center for Specialized Diabetes Foot Care (800-543-9055)
- Connecticut Bioinstruments Inc. (800-336-1935)
- Medical Monofilament Manufacturing, LLC (508-746-7877)
- North Coast Medical, Inc. (800-821-9319)
- Sensory Testing Systems (225-923-1297)
- Smith & Nephew, Inc. (800-558-8633)
- You may also want to check with your local pharmaceutical representatives

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Section 8: Pregnancy and Diabetes

A. Pregnancy and Pre-Existing Diabetes

(NOTE: See B. page 37 for Gestational Diabetes Mellitus)

Diabetes control prior to, as well as throughout pregnancy, is essential for positive health outcomes for the mother with diabetes and her infant. Serious malformations can occur early in pregnancy, even before the woman knows she is pregnant. Congenital anomalies are more likely in infants of women with diabetes. The increased risk for anomalies ranges from 6 to 12%, a two to fivefold increase over the 2-3% incidence noted in the general population. This increased incidence of congenital anomalies accounts for about 40% of the deaths of infants of women with diabetes. There is a growing body of assessment indicating an increased risk of preterm low birth-weight delivery among mothers with severe periodontal disease. Intensive diabetes management, including optimal blood glucose control, preconception counseling and education can reduce the incidence of maternal and fetal complications. With proper counseling, management, and specialty care, the outcome of most diabetic pregnancies can approach that of non-diabetic pregnancies.

Preconceptual Assessment

Preconceptual counseling should begin with the onset of puberty and continue until menopause for women with diabetes. All women, including teenagers, who have the desire to delay pregnancy, should be given general information about the risks of pregnancy and the importance of contraception and preconceptual planning. Counseling should be explicitly integrated into routine diabetes care and total health management. The use of low dose oral contraceptives in women with diabetes should probably be restricted to patients without vasculopathy or additional risk factors, such as strong family history of heart disease. The lowest dose of estrogen and progesterone should be prescribed. Patients taking oral contraceptives should have their blood pressure monitored after the first cycle of medications and then quarterly. Baseline and follow-up lipid levels should also be determined.

Consultation by a health professional with expertise in preconceptual care is essential for all women with diabetes who plan a pregnancy within the next year. Counseling should include: contraceptive advice including beliefs about fertility and contraception; maternal, fetal, and neonatal risks of pregnancy; genetic counseling; maintenance of normal blood glucose levels; and the need for the personal commitment to intensive diabetes management. Women of reproductive age should be advised to take multivitamin supplements containing 0.4 mg of folic acid daily. Women with offspring previously affected by neural tube defects who intend to become pregnant should take daily supplementation containing 4.0 mg of folic acid in the periconceptual period to reduce the risk of recurrence.

Specific concerns related to pregnancy and each individual woman's special circumstances, such as their history of diabetes control or complications, should be addressed. Attempts should be made to achieve optimal control of blood glucose prior to conception and before discontinuing contraception. Existing health problems, such as hypertension, retinopathy, renal dysfunction, gastroparesis and other neuropathies, depression, and periodontitis, should be assessed and stabilized prior to pregnancy. Coronary artery disease is a relative contraindication to pregnancy. If diabetes has been present for >10 years, the woman should be screened with an electrocardiogram.

All the woman's medications must be evaluated for safety and possible teratogenicity and alternative therapies initiated before conception. Specialists and pharmacists should be consulted to determine appropriate drug therapy. Numerous medications are *contraindicated* during pregnancy, including, but not limited to: angiotensin II blockers and angiotensin converting enzyme (ACE) inhibitors. *The current standard of care for glucose control during pregnancy is insulin therapy. Oral anti-diabetic agents are not approved at this time.* Management by specialty care is recommended if selected use of beta-blockers

or diuretics are deemed necessary for hypertension control during pregnancy**.** Cessation of smoking, alcohol and unnecessary medications should also be discussed.

Patients should be educated on dietary needs, proper physical activity regimens, oral health care routines, and special glycemic goals for preconception and pregnancy, as well as prevention of hypoglycemia and hyperglycemia. Adjustments to diet, insulin and physical activity should be made as needed to achieve and maintain optimal glycemia.

Self-monitoring of blood glucose (SMBG) must be taught and supported. *Providers need to be aware that some patients have glucose meters that give values calibrated to whole blood and others to plasma. Health care providers should discuss this while setting SMBG goals with the patient.* Glucose testing is usually recommended 4-8 times per day. Times of testing should be based on the patient's individual needs necessary to establish control. Patients should be instructed in maintenance of a log and how to adjust their treatment plan (diet, physical activity and medication) based on results.

Hemoglobin A1c (HbA1c) should be at or below the upper limit of normal for a given lab. HbA1c should be monitored every 6-8 weeks to measure ongoing glycemic control and treatment effectiveness. Patients should be informed of the significance of results to reinforce the importance of good glycemic control and help foster commitment to the management plan. Efforts to remove barriers that may prevent optimal preconceptual care must be addressed.

Initial preconceptual screening should include, but not be limited to, the following:

- Complete history and physical, including risk factors and specifics on current diabetic regimen, cardiac and gynecologic evaluation, dilated retinal examination, depression screen and assessment of patient's beliefs about fertility and contraception.
- Laboratory evaluation of: HbA1c, urinalysis with culture and sensitivity, 24-hour urine for creatinine clearance and total protein, and thyroid stimulating hormone (TSH), in addition to those relating to the woman's general health status.

Qualified Provider, Referral, and Coordination of Care

Diabetes management should be provided by a team led by a perinatologist, endocrinologist and obstetrician/gynecologist with expertise is high-risk pregnancy. Other team members include the primary care physician, a diabetes educator, and a registered dietitian. If a team is not available, consultation for these services is essential. Referrals to appropriate specialty services, such as ophthalmology/optometry, cardiology, nephrology, dentistry, and social work, for co-management should be made in a timely manner when indicated by the patient’s status. The Wisconsin Association for Perinatal Care supplies a list of perinatal centers (608-267-6060).

Ongoing communication among all professionals involved in treating the patient is essential to ensure optimal diabetes management during pregnancy. Efforts to remove barriers that may prevent optimal preconceptual and pregnancy care must be addressed. Post-partum care for the patient with pre-existing type 1 diabetes involves continued tight glucoregulation with regular visits (schedule dependent on the physician) and resumption of counseling for subsequent pregnancies. The offspring should be closely monitored for obesity and glucose intolerance and receive advice on nutrition and physical activity.

Patient Education

All women with diabetes should be fully informed of the risks associated with pregnancy, prevention strategies, and options for treatment. Culturally appropriate approaches and materials should be used as needed. Education should include, but not be limited to, the following:

- Preconception counseling and pregnancy planning are essential.
- Conception should be delayed until blood glucose control is optimal as measured by HbA1c.
- It is necessary to adhere to the management plan for a healthy pregnancy and infant.
- The risks during pregnancy can be minimized with proper management.
- Intensive self-monitoring of blood glucose with adjustment of diet, physical activity and medications is essential to attain and maintain glucose control.
- Urine ketone testing is recommended daily during pregnancy, in addition to blood glucose monitoring.
- Patients should be informed about medications that are contraindicated during pregnancy, as well as those that are safe and necessary to control glucose and overall management.
- It is essential to stop smoking, the use of alcohol, and unnecessary medications prior to pregnancy.
- Pregnancy can accelerate retinopathy.
- Patients and family members should be informed of how and when to notify the physician and other health care team members.
- Breast-feeding is promoted for all infants and may provide additional benefits because of possible risk for future metabolic disturbances.

B. Gestational Diabetes

Gestational diabetes mellitus (GDM) is defined as any degree of glucose intolerance with onset first recognized during pregnancy. It is possible that glucose intolerance diagnosed in pregnancy may antedate the pregnancy or start with it. The prevalence of GDM among U.S. women is approximately 4%, however the rate may vary between 1-14% dependent on the population studied and method of diagnostic tests utilized. GDM is more prevalent with advancing age, obesity, family history of diabetes, personal history of abnormal glucose tolerance, prior macrosomic infant, poor obstetric outcome, and in populations with a high rate of type 2 diabetes (Native Americans, African Americans and Hispanics).

Uncontrolled GDM carries risks to both the mother and fetus. The intrauterine nutritional environment may set the stage for the infant's metabolic lifetime risks, including an increased risk for the development of diabetes. Perinatal complications include macrosomia and its associated delivery risks. Post-partum delivery risks include hypoglycemia, seizures, hypocalcemia, polycythemia and jaundice. GDM is associated with an increase in hypertensive disorders, such as pre-eclampsia, and the need for cesarean deliveries. The woman with GDM is at risk for development of GDM in subsequent pregnancies, as well as type 2 diabetes and its associated metabolic disorders including hypertension, dyslipidemia and arterioscleotic cardiovascular disease.

Screening and Detection

The screening and methodology for detection of GDM is **controversial.** Although selective screening was proposed by the both Third and Fourth International Workshop Conferences on Gestational Diabetes Mellitus, each health care provider should utilize current scientific data and individual assessment of the patient and/or clinical setting when making decisions regarding screening and methodology for detection. Method of choice may depend on what is appropriate for the patient population. Consultation with a local expert for recommendations may be helpful. About 70% of practitioners in the United States use universal screening. Caution should be used in adopting selective screening.

Risk assessment for GDM should take place at the first prenatal visit. Women at high risk for GDM (marked obesity, personal history of GDM, prior macrosomic infant, glucosuria or a strong family history of diabetes) should undergo glucose testing as soon as possible. If GDM is not diagnosed at that time, re-testing should take place at 24-28 weeks. If a woman is not high risk, screening should take place at 24-28 weeks with a 50-g oral glucose load followed by a 1-hr post load glucose level. If the glucose level is equal to or greater than 140mg/dl the woman should undergo a 100-g glucose tolerance test. *A GDM diagnosis is made on two abnormal glucose values. Criteria for two methods include:*

100g oral glucose tolerance test (plasma glucose levels)

	O'Sullivan	Fourth International Workshop (Carpenter and Coustan) {1998}
Fasting	105	95
1 hr	190	180
2 hr	165	155
3 hr	145	140

Qualified Provider, Referral, and Coordination of Care

Diabetes management should be provided by health care professionals with knowledge of the special needs of pregnancy and diabetes. Outcomes are generally more positive with use of an experienced team, including, but not limited to the primary care physician and endocrinologist, obstetrician with expertise in diabetes care, perinatologist, diabetes educator, registered dietitian, eye care provider, dentist, and other specialists as needed. Post-partum follow-up care should include a family approach.

Post-partum contraception should be addressed as a component of prenatal education to avoid the possibility of pregnancy before glucose tolerance is assessed at the post-partum visit. Low dose oral contraceptives may be used safely by women who experienced gestational diabetes and have no other risk factors. As with any patient started on oral contraceptives, serial blood pressure and lipids need to be followed. The woman should be instructed on the risks for development of diabetes and the potential for its associated metabolic abnormalities including hypertension, dyslipidemia and arteriosclerotic cardiovascular disease.

The mother's glycemic status should be reassessed 6 weeks after delivery, using the American Diabetes Association's guidelines on diagnosis and classification of diabetes. Utilization of fasting blood glucose may have low sensitivity for detecting abnormal glucose tolerance, therefore the provider should consider doing a standard 75- g 2 hour OGTT. The provider should evaluate glucose, blood pressure, weight, lipids, and thyroid function on an annual basis. The health care provider should assist the patient with goal setting that will decrease the risk for development of diabetes. The woman should receive education on the role of appropriate nutrition and physical activity. Providers should empower the mother to take responsibility for making lifestyle changes to reduce the risk of development of diabetes and to seek care for rescreening. The offspring of GDM should be closely monitored for obesity and glucose intolerance and receive advice on nutrition and physical activity.

Patient Education

All patients with diabetes mellitus should be fully informed of the need for good diabetes management and the prevention of complications. Culturally appropriate approaches and materials should be used as needed. Education should include, but not be limited to, the following:

- Instruction on self-monitoring of blood glucose techniques, goals and the relationship of SMBG results to diet, physical activity and insulin are essential.
- It is necessity to adhere to the management plan for a healthy pregnancy and infant.
- The risks of GDM can be minimized with proper management.
- Urine ketone testing during pregnancy is recommended, in addition to blood glucose monitoring.
- Patients should be informed of medications that are contraindicated during pregnancy, as well as those that are safe and necessary to control glucose and overall management.
- Patients should be informed of how and when to notify the physician and other health care team members.
- Breast-feeding is promoted for all infants and may provide additonal benefits because of possible risk for future metabolic disturbances.
- The 6 week post-partum follow-up visit should evaluate weight, blood pressure, and a 75 gm glucose tolerance test
- Revaluation of glucose tolerance should be done annually.
- Lifestyle change education is essential to promote achievement or maintenance of good nutrition and to promote physical activity.
- It is essential to review the risk for development of GDM in subsequent pregnancies or development of diabetes later in life, as well as the risks to the offspring, such as increased risk for diabetes, obesity and potential learning deficits.
- A subsequent pregnancy should be delayed until post-partum glucose tolerance is assessed.

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Section 9: Self-Management Training

Self-management training is the foundation of treatment for all persons with diabetes mellitus. As a consequence of dramatic changes which have occurred in diabetes care in a relatively short period of time, people with diabetes are assuming greater challenges in the self-care demands of their disease. Ongoing education is essential in order to provide patients and their family/caregivers with the knowledge and skills to effectively manage their diabetes, promote necessary lifestyle changes, and decrease or prevent complications. Family members or other caregivers should be encouraged in participate in diabetes education with the patient. Appropriate approaches and materials should be used as needed, with special attention to address particular cultural, financial, social, age, literacy level, physical, mental, or emotional needs. Education should provide consistent information, tailored to the individual client, that is coordinated and reinforced by a health care team. Realistic, individual treatment goals must be negotiated jointly with the primary care provider, patient, family and health-care team. Goals and interventions need to be evaluated regularly and revised when necessary to achieve desired health outcomes.

Content

Revised National Standards for Self-management Training include the following components:

- diabetes disease process and treatment options
- psychosocial adjustment to daily life
- nutritional management
- physical activity
- medications for therapeutic effectiveness
- monitoring & use of results
- prevention, detection, and treatment of acute complications
- preventing, detecting, and treating chronic complications (risk reduction behavior)
- goal setting and problem-solving
- preconception care, pregnancy, and gestational diabetes (if applicable)

Frequency

Diabetes mellitus is a complex, lifelong, chronic illness with rapidly changing treatment modalities. Since technological advances, professional and individual knowledge level, disease status, and lifestyle practices change over time, training should be provided at the time of diagnosis, as well as regularly every 6 to 12 months throughout the patient's lifetime. Additional diabetes education is essential with major changes in treatment, if the patient is having difficulty adhering to the prescribed treatment regimen, at times of uncontrolled diabetes, with hospitalization for DKA or hypoglycemia, with the onset of complications, with pregnancy planning and during pregnancy. Family members or other caregivers should be encouraged to attend education visits with the patient.

Qualified Provider

Self-management training should be provided by health care professionals with knowledge and expertise in the management of diabetes mellitus, preferably *certified diabetes educators* (CDEs). Diabetes educators may include, but are not limited to, registered dietitians, registered nurses, physicians, pharmacists, social workers, physician assistants, and podiatrists. To be *certified,* diabetes educators must meet specific requirements regarding professional education and experience in diabetes management, counseling and education, as well as pass a qualifying exam. Providers without designated diabetes educators may find it beneficial to refer and coordinate care with diabetes educators and health education programs within their local communities. The American Association of Diabetes Educators has a toll-free number, 1-800-832-6874, which can provide names and addresses of local certified diabetes educators. Also, the American Diabetes Association, at 1-800-DIABETES or http://www.diabetes.org has a list of recognized diabetes education programs.

Referral & Coordination of Care

Referrals to specialty services for co-management and consultation should be made in a timely manner when indicated by the patient's status. Ongoing communication among all professionals involved in treating the patient is essential to ensure optimal diabetes management.

Helpful Tools

- Useful publications are available from the American Diabetes Association and the American Association of Diabetes Educators, including: *Single Topic Diabetes Resources and Facilitating Lifestyle Change.*
- First Contact: a guide to teaching diabetes management skills to newly diagnosed patients, 1999, published by the American Association of Diabetes Educators (AADE).
- Life with Diabetes: a series of teaching outlines by the Michigan Diabetes Research & Training Center, 2nd edition, 2000, published by the American Diabetes Association.
- Diabetes Education Goals, American Diabetes Association, 1995.
- The Art of Empowerment, American Diabetes Association
- A sample flow sheet for self-management training is included in this guideline appendix.
- Personal Diabetes Care Records - English, Spanish, Hmong - http://www.dhfs.state.wi.us/health/diabetes/DBMCGuidelns.htm
- National Diabetes Education Program. To order materials call (800) 438-5383; To speak to a diabetes information specialist call (800) 860-8747. Or visit the NDEP website: http://ndep.nih.gov.
- *Take Charge of Your Diabetes*, 2nd edition, US Dept. of Health & Human Services, National Center for Chronic Disease Prevention & Health Promotion, Division of Diabetes Translation, 1997. (CDC publication - in English and Spanish - any or all of the contents may be reproduced; both versions are available on the Internet at http://www.cdc.gov/diabetes/pubs/pubs.htm. Organizations may print and personalize this document adding their own organization's name.
- *Safe at Home with Diabetes (2nd edition, 2001),* Maxishare, PO, Box 2041, Milwaukee, WI 53201. A manual to teach newly diagnosed children with diabetes.
- *Living with Diabetes: Tips for Teachers,* (video, 1996), Maxishare, PO Box 2041, Milwaukee, WI 53201. Available free of charge to schools that service Wisconsin children with diabetes.
- Other useful tools include: patient wallet cards, flow sheets, blood glucose logs, food, and physical activity records. Most pharmaceutical companies also have many useful professional tools and patient education resources.

Specific References:

1. A Core Curriculum for Diabetes Education third edition, American Association of Diabetes Educators, 1998.
2. National Standards for Diabetes Self-Management Education Programs, *Diabetes Care*, 24: S126-S133, 2001.
3. Clement S., Diabetes Self-management education, *Diabetes Care*, 18:(8);1204-1214, 1995.
4. Funnell, M, Arnold, M, Life with Diabetes: A series of teaching outlines by the Michigan Diabetes Research & Training Center, 2nd edition, 2000 (ADA publication).
5. Ruggiero L, Prochaska JO, Readiness for Change: Application of the transtheoretical model to diabetes, *Diabetes Spectrum*, 6: (1), 21-59, 1993.
6. Wierenga ME, Browning JM, Mahn JL, A descriptive study of how clients make lifestyle changes, *The Diabetes Educator*, 16: (6) 469-473, 1990.
7. Anderson B, Rubin R, Practical Psychology for Diabetes Clinicians, How to Deal with the Key Behavioral Issues Faced by Patients & Health Care Teams, American Diabetes Association, 1996.
8. Diabetes Education Goals, American Diabetes Association, 1995.
9. Woolf S, Jonas S, Lawrence R, Health Promotion and Disease Prevention in Clinical Practice, Williams & Wilkins, 1996.
10. ADA, Position Statement, Tests of Glycemia, *Diabetes Care, 24: (supp 1), S80-S82, 2000.*

Section 10: Medical Nutrition Therapy

Medical nutrition therapy (MNT) is a cornerstone of management for diabetes mellitus. Early intervention and appropriate follow-up by a registered dietitian (preferably a CDE) are essential to achieve and maintain glycemic control and reduce the risk of cardiovascular disease. MNT can support other therapies to help prevent and/or delay the onset or progression of costly diabetes-related complications and hospitalizations. With its emphasis on diet and physical activity, MNT may also help to reduce medication use.

New 1994 nutrition recommendations specify that an individual nutrition prescription should be developed based on a comprehensive assessment of the patient's metabolic, nutrition, and lifestyle factors and include the development of realistic and achievable goals. Standardized calorie-level meal plans are no longer recommended. Interventions should be tailored to the individual patient's needs and include strategies to empower responsibility for self-management. For example, an individual's nutrition prescription may be as simple as three regularly scheduled meals without sweetened beverages, or as complex as the use of carbohydrate-insulin ratios for patients on insulin pumps.

Evaluation of medical nutrition therapy should be outcome driven, with success measured through metabolic parameters, such as blood glucose self-monitoring results, glycated hemoglobin and lipid levels, body weight, blood pressure, satisfaction with care provided, and quality of life issues, as well by the absence of complications, the reduced need for emergency visits, or the reduced need for medication. Medical nutrition therapy is an ongoing, individualized, cyclical process that should include the following steps: nutrition assessment; set nutrition goals; provide education and interventions; evaluation; and follow-up plan of care.

Goals

The goals of the 1994 nutrition recommendations for all people with diabetes are to achieve blood glucose goals, to achieve optimal blood pressure and blood lipid levels, to provide appropriate calories for reasonable weight, normal growth and development, pregnancy and lactation, to prevent, delay, or treat nutrition-related complications, and to improve health through optimal nutrition.

Frequency of Visits

Nutrition intervention should be provided at regular intervals throughout the patient's lifetime to promote necessary long-term behavior changes. Family members or other caregivers should be encouraged to attend therapy visits with the patient. It is recommended that persons aged 18 years and younger with type 1 diabetes receive medical nutrition therapy at the time of diagnosis and ongoing every 3 to 6 months. Those with type 1 diabetes over the age of 18 years and those with type 2 diabetes should receive medical nutrition therapy at the time of diagnosis and ongoing every 6 to 12 months. Increased frequency of medical nutrition therapy is essential at initial diagnosis, during major changes in therapy, at times of uncontrolled diabetes, with hospitalization for DKA or hypoglycemia, with onset of complications, with pregnancy planning and during pregnancy.

Qualified Provider & Referrals

Due to the complexity of diabetic nutrition issues, it is recommended that patients be referred to a registered dietitian (RD) who is skilled in the current recommendations of diabetes care. Although other health professionals contribute to medical nutrition therapy, the registered dietitian should be the member of the diabetes treatment team who is responsible for coordinating overall medical nutrition therapy to ensure individualization of assessment, planning, intervention, evaluation, and follow-up.

Access

The greatest barriers to diabetes medical nutrition therapy are lack of referral and insufficient reimbursement. A referral to a dietitian provides the patient with the message that medical nutrition therapy is a necessary component of diabetes control. The American Dietetic Association has a toll-free nationwide nutrition network, 1-800-366-1655, which can provide names and addresses of RDs with diabetes expertise. Dietitians may also be located through hospitals, clinics, public health departments and the American Diabetes Association's recognized programs (1-800-DIABETES).

Referral and Coordination of Care

Referrals to specialty services for co-management and consultation should be made in a timely manner when indicated by the patient's status. Ongoing communication among all professionals involved in treating the patient is essential to ensure optimal diabetes management.

Essential Patient Education

All patients with diabetes mellitus should be fully informed of the necessity for good nutrition management for optimal diabetes control. Culturally appropriate approaches and materials should be used as needed. Education should include, but not be limited to, the following:

- Patients should be informed of the relationship of nutrition, physical activity and medication to blood glucose control, lipid levels, blood pressure control and management of diabetes.
- Patients should be taught how to make improved food choices.
- Recommendations should be given for decreased fat and/or protein intake, if indicated.
- Information regarding the effect of carbohydrates on blood sugar should be emphasized.
- If overweight, the patient should be counseled about the value of even modest reductions in weight (10 pounds) to diabetes control.
- Self-monitoring blood glucose results should be used to adjust diet and activity level.
- The patient and diabetes team should jointly identify realistic metabolic, lifestyle change, and education goals.
- Regular visits are necessary to achieve and maintain diabetes management.
- Patients should be made aware of any special health concerns.
- Information regarding the availability of resources and support is essential.

Helpful Tools

- Publications from the American Diabetes Association: *Single Topic Diabetes Resources, Facilitating Lifestyle Change Resource Manual.* Various booklets - i.e., *The First Step in Diabetes Meal Planning, Healthy Food Choices, Carbohydrate Counting* (3 booklets) - *Level 1 - Getting Started, Level 2 - Moving On, Level 3 - Using Carbohydrate/Insulin Ratios, Month of Meals* series of menus and cookbooks, and, *Exchange Lists for Meal Planning.*
- *Life with Diabetes*: A Series of Teaching Outlines by the Michigan Diabetes Research and Training Center (published by the American Diabetes Association)
- Dietary Guidelines for Americans, Fifth Edition, http://www.health.gov/dietaryguidelines/ or are available from the Consumer Information Center, Dept 378-C, Pueblo, CO 81007.
- Clinical Guidelines for the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults, National Heart, Lung and Blood Institute, http://www.nhlbi.nih.gov/guidelines/obesity/ob_home.htm
- Pediatric Growth Charts, Vital Statistics of the CDC, National Center for Health Statistics, Advance Data, #315, May 30, 2000, available at http://www.cdc.gov/nchs/about/major/nhanes/growthcharts/fullreport.htm
- BMI charts for children, National Center for Chronic Disease & Health Promotion, Nutrition and Physical Activity, http://www.cdc.gov/nccdphp/dnpa/bmi/bmi-for-age.htm

- BMI charts for adults, National Center for Chronic Disease Prevention & Health Promotion, Nutrition and Physical Activity, http://www.cdc.gov/nccdphp/dnpa/bmi/bmi-adult.htm
- *Dietary Approaches to Stop Hypertension*, National Heart, Lung, and Blood Institute, available at http://www.nhlbi.nih.gov/health/public/heart/hbp/dash/dashdiet.pdf
- *Healthy Eating* and *The Activity Pyramid (*International Diabetes Center), *Guide to Good Eating* (Dairy Council), *The Food Guide Pyramid* (American Dietetic Association), and various blood glucose logs, food and physical activity record forms, flow sheets, and patient and professional educational materials from pharmaceutical and other companies.

Specific References

1. Franz MJ, Monk A, Barry B, McClain K, Weaver T, Cooper N, Upham P, Bergenstal R, Mazze R, Effectiveness of medical nutrition therapy provided by dietitians in the management of non-insulin dependent diabetes mellitus: A randomized, controlled clinical trial, *Journal of the American Dietetic Association*, 95:1009-1017, 1995.
2. Franz, MJ, Splett P, Monk A., Barry B, McClain K, Weaver T, Upham P, Bergenstal R, Mazze R, Cost-effectiveness of medical nutrition therapy provided by dietitians for persons with non-insulin dependent diabetes mellitus, *Journal of the American Dietetic Association*, 95:1018-1024, 1995.
3. Monk A, Barry B, McClain C, Weaver T, Franz M, Practice guidelines for medical nutrition therapy provided by dietitians for persons with non-insulin dependent diabetes mellitus, *Journal of the American Dietetics Association*, 95, (9): 999-1006.
4. American Diabetes Association, Position Statement, Nutrition Recommendations and Principles for People with Diabetes Mellitus, *Diabetes Care*, 23 (supp 1): S43-S46, 2000.
5. A Core Curriculum for Diabetes Education, 3rd Edition, American Association of Diabetes Educators, 1998.
6. Holler HJ, Pastors JG, Diabetes Medical Nutrition Therapy, The American Dietetic Association/American Diabetes Association, 1997.
7. Nutrition therapy protocols for insulin-dependent diabetes mellitus, non-insulin-dependent diabetes mellitus, and gestational diabetes mellitus, Medical Nutrition Therapy Across the Continuum of Care, American Dietetics Association, 1996.
8. Meal Planning Approaches for Diabetes Management, 2nd edition, Diabetes Care and Education Dietetic Practice Group of the American Dietetic Association, 1994.

Section 11: Immunizations

Each year about 60,000 people die in the U.S. from vaccine-preventable diseases. The majority of these are adults who die of complications from influenza and pneumococcal disease. Influenza and pneumococcal disease together are the sixth leading cause of death for older adults. Although complications can occur at any age, the elderly and people with chronic health conditions are more likely to develop serious, life-threatening complications than younger, healthier people.

Influenza Vaccine & Diabetes

Much of the illness and death caused by influenza can be prevented with annual influenza vaccination. Influenza causes about 20,000 deaths per year. The Centers for Disease Control and Prevention (CDC) reports indicate that people with diabetes mellitus are six times more likely to be hospitalized during an influenza outbreak compared with those without diabetes.

The Advisory Committee on Immunization Practices (ACIP) strongly recommends influenza vaccine for any person aged $\geq$ 6 *months* who, because of age or underlying medical condition, is at increased risk for complications of influenza. One dose of influenza vaccine is given annually. Two doses of influenza vaccine, administered at least one month apart, are recommended for children 6 months through 8 years of age who are receiving the vaccine for the first time. Chronic cardiovascular, pulmonary, and metabolic disorders (including diabetes) are among these medical conditions. ACIP also recommends that women who will be in the second or third trimester of pregnancy during the influenza season should be vaccinated. ACIP recommendations should be consulted for specific precautions, specific contraindications to vaccination, side effects and adverse reactions.

Influenza Revaccination

Annual vaccination with the current vaccine is necessary because immunity declines in the year following vaccination and new strains of vaccine are added to the formulation.

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Pneumococcal Vaccine & Diabetes

Streptococcus pneumoniae (pneumococcus) infection causes illness and death among the elderly and persons who have certain underlying medical conditions. Pneumococcal disease causes an estimated 40,000 deaths annually in the U.S., accounting for more deaths than any other vaccine-preventable bacterial disease. About half of these deaths could potentially be prevented with use of the pneumococcal polysaccharide vaccine (PPV**).** The bacterium causes serious infections, resulting in more than 500,000 cases of pneumonia, 50,000 cases of bacteremia, and 3,000 cases of meningitis annually. The risk of serious complications, as well as the recent evidence of antibiotic-resistant pneumococci, compound the management of invasive pneumococcal disease and emphasize the importance of the Advisory Committee on Immunization Practices (ACIP) and the Academy of Pediatrics Report of the Committee on Infectious Diseases (Red Book 2000) vaccination recommendations.

ACIP recommends that PPV vaccine be used more extensively for all persons at increased risk for pneumococcal disease or its complications. All persons over $\geq$ 65 *years* should receive one dose of the vaccine. This includes previously unvaccinated persons and persons who have not received vaccine within 5 years and were < 65 years of age at the time of vaccination - see Pneumococcal Revaccination section below.

Vaccination with PPV is also recommended for persons aged 2-64 years who are at increased risk for pneumococcal disease or its complications if they become infected with *Streptococcus pneumoniae*.

Persons at increased risk of severe disease include those with chronic illness such as chronic cardiovascular disease (e.g.. congestive heart failure or cardiomyopathies), chronic pulmonary disease (COPD or emphysema, but not asthma), *diabetes mellitus*, alcoholism, chronic liver disease (cirrhosis), or CSF leaks. Diabetes mellitus often is associated with cardiovascular or renal dysfunction, which increase the risk for severe pneumococcal illness. Previous studies have shown an increased risk of pneumococcal bacteremia during episodes of diabetic ketoacidosis, although age specific information is limited.

On October 6, 2000, the ACIP recommended pneumococcal conjugate vaccine (PCV) for all children 2-23 months of age. The ACIP also recommended PCV vaccine for children 24-59 months of age who are at high risk of pneumococcal infection caused by an underlying medical condition, such as children with diabetes mellitus.

The ACIP or Red Book 2000 recommendations should be consulted for precautions, contraindications to use, side effects, adverse reactions, and additional information. The safety of the vaccine during the first trimester of pregnancy has not been evaluated.

Pneumococcal Revaccination (PPV)

1. Aged $\geq$ 2-64 years with diabetes mellitus: routine revaccination is *not* recommended. However, revaccination is recommended for persons $\geq$ 2-64 years old with diabetes mellitus who also have an increased risk for serious pneumococcal infection or for a rapid decline in antibody levels (functional or anatomic asplenia, HIV infection, leukemia, lymphoma, Hodgkin's disease, multiple myeloma, generalized malignancy, chronic renal failure, nephrotic syndrome, or other conditions associated with immunosuppression such as organ or bone marrow transplantation or receiving immunosuppressive therapy). Some persons with diabetes mellitus who do not have these additional risk factors may benefit from revaccination with PPV and may receive a second dose provided there are no contraindications to receiving the vaccine and at least five years have elapsed since receiving the first dose.
2. Aged $\geq$ 65 years: second dose recommended if the patient received the first dose $\geq$ five years previously and was aged < 65 years at the time of the primary vaccination. Some persons who were initially vaccinated with PPV at age $\geq$ 65 years old may benefit from revaccination with PPV and may receive a second dose provided there are no contraindications to receiving the vaccine and at least five years have elapsed since receiving the first dose.
3. The ACIP statement on prevention of pneumococcal disease notes that the need for doses of PPV subsequent to the second dose is unclear and will be assessed when additional data become available. Because data are insufficient concerning the safety of pneumococcal vaccination with PPV when administered three or more times, revaccination following a second dose is not routinely recommended.
4. CDC/ACIP recommendations should be consulted for other special circumstances.

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Patient Education

Culturally appropriate approaches and materials should be used as needed. Education should include, but not be limited to, the following:

- Immunization can prevent serious illness, complications, and the need for hospitalizations associated with influenza and pneumococcal disease.
- Patients should be informed of side effects and adverse reactions to immunizations. The pamphlet titled "*Protect Yourself against Influenza and Pneumococcal Pneumonia,*" POH 4366, is available

from the Wisconsin Immunization Program, 1 W. Wilson Street, Rm 318, P O Box 2659, Madison, WI 53701-2659, (608-266-2346).

Immunization Record Keeping

To help prevent the administration of unnecessary doses, every patient should be given a record of vaccinations. Primary care providers should also ensure that childhood and other recommended preventive vaccinations are up to date.

Specific references

1. Peter G, Report of the Committee on Infectious Diseases, 25th Edition, Red Book 2000, American Academy of Pediatrics
2. Guide to Clinical Preventive Services, Report of the U.S. Preventive Task Force, 2nd Edition. International Medical Publishing Inc. (same text was also published by the CDC/DHHS)
3. Centers for Disease Control and Prevention, Preventing Pneumococcal Disease among Infants and Young Children, recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR, October 6, 2000;49(RR09):1-38.
4. MMWR: Prevention and Control of Influenza, Recommendations of the Advisory Committee on Immunization Practices (ACIP), April 14, 2000, Volume 49 (RR-03).
5. ADA Position Statement, Immunization and the Prevention of Influenza and pneumococcal disease in people with diabetes**,** *Diabetes Care***,** vol 24 (supp 1), January 2001**.**
6. MMWR: Prevention of Pneumococcal Disease, Recommendations of the Advisory Committee on Immunization Practices, April 4, 1997, Volume 46 (RR-8).
7. MMWR: Use of standing orders programs to increase adult vaccination rates, March 24, 2000, volume 49 (RR01) .
8. Clinician's Handbook of Preventive Services, Put Prevention into Practice, 1994.
9. Kronenberger C, Hoffman R, Lezotte D, Marine W, Invasive Penicillin-Resistant Pneumococcal Infections: A Prevalence and Historical Cohort Study, *Emerging Infectious Diseases*, 2(2):121-124. 1996, Centers for Disease Control.
10. Austrian R, Gold J, Pneumococcal bacteremia with special reference to bacteremic pneumonia, *Annals of Internal Medicine*, 60: 759-776, 1964.
11. Mufson MA, Pneumococcal infections, *JAMA*, 246: 1942-1948, 1981.

Appendix--Tools

Criteria for Diagnosis of Diabetes and Testing Asymptomatic, Undiagnosed Individuals

A: Criteria for Diagnosis of Diabetes - American Diabetes Association

Assess potential for hyperglycemia from drug therapy.

Fasting plasma glucose (preferred method) ≥ 126 mg/dl
(Fasting is defined as no caloric intake for at least 8 hours)

or

Symptoms of diabetes plus random plasma glucose ≥ 200 gm/dl
(R*andom is defined as any time of day without regard to time since last meal.*
The classic symptoms of diabetes include polyuria, polydipsia, and unexplained weight loss).

or

2 hour plasma glucose during an oral glucose tolerance test ≥ 200 gm/dl
(*The test performed as described by the World Health Organization,*
using a glucose load containing the equivalent of 75-g anhydrous glucose dissolved in water.)

In the absence of unequivocal hyperglycemia with acute metabolic decompensation, the criteria should be confirmed by repeat testing on a different day. The third measure, OGTT, is not recommended for routine clinical use.

B: Recommendations for testing for type 2 diabetes in asymptomatic, undiagnosed individuals

1. Evaluation for diabetes should be performed within the health care setting. Community screening is not recommended.

2. Patients should be screened at 3-year intervals beginning at age 45 years; testing should be considered at a younger age or be carried out more frequently if diabetes risk factors are present. These include:
   - Overweight (BMI ≥ 25 kg/m²) *
   - Waist circumference > 35 inches for women and > 40 inches for men *
   - Family history of diabetes (i.e., parents or siblings with diabetes)
   - Members of a high-risk ethnic or racial group (e.g. African-American, Hispanic-American, Native American, Asian American, Pacific-Islander)
   - Habitual physical inactivity
   - Previously identified IFG (impaired fasting glucose) or IGT (impaired glucose tolerance)
   - Hypertension (≥ 140/90 mm/Hg in adults)
   - HDL-cholesterol level ≤ 35 mg/dl and/or a triglyceride level of ≥ 250 mg/dl
   - Polycystic ovary syndrome (PCOS)
   - Delivery of a baby weighing > 9 pounds or history of gestational diabetes

** Modified by the Wisconsin Diabetes Advisory Group from the diagnostic criteria and screening recommendations of the Report of the Expert Committee on the Diagnosis and Classification of Diabetes Mellitus, Diabetes Care,24: S5-S20, 2001.*

Essential Diabetes Mellitus Care Guidelines - Wisconsin

Care is a partnership between the patient, family, and the diabetes team:
primary care provider, diabetes educator, nurse, dietitian, pharmacist and other specialists.

Abnormal physical or lab findings should result in appropriate interventions.

For particular details and references for each specific area, please refer to the supporting documents and implementation tools in the full-text guideline available via the Internet at **http://www.dhfs.state.wi.us/health/diabetes/DBMCGuidelns.htm** or call (608) 261-6871.

Concerns	Care/ Test	Frequency
General Recommendations	• Diabetes focused visit..... • Review management plan, problems & goals…….. • Assess Physical Activity/Diet/Weight-BMI/Growth…….	*Type 1**: every 3 months *Type 2**: every 3 - 6 months * or > often based on control & complications Each focused visit; revise as needed Each focused visit
Glycemic Control	• Review meds & frequency of low blood sugar..... • Self blood glucose monitoring, set & review goals..... • HbA1C - [goal: < 7.0% or ≤ 1% above lab norms].....	Each focused visit 2 - 4 times/day or as recommended Every 3 - 6 months
Kidney Function	• Urine for microalbumin: [if **higher** than 30 mcg/mg creatinine or > 30 mg/24 hours, initiate ACE inhibitor (unless contraindicated)] • Creatinine clearance & protein…… • Urinalysis.....	*Type 1:* Begin with puberty or after 5 yrs' duration, then yearly *Type 2:* At diagnosis, then yearly Yearly, after microalbuminuria > 300mg/24 hour At diagnosis and as indicated
Cardiovascular	• Smoking status..... • Lipid profile…… Adult goals: Triglycerides <200 mg/dl HDL >45 mg/dl LDL <100 mg/dl (optimal goal) • Blood pressure ..... Goals [**adult:** < 130/80] [If evidence of diabetic nephropathy, goal <125/75] [**peds:** below 90% of ideal for age] • Aspirin prophylaxis (unless contraindicated).....	Assess each visit; if smoker, counsel to stop; refer to cessation *Children:* If > 2 years, after diagnosis & once glycemic control is established - repeat yearly if abnormal. Follow National Cholesterol Education Program (NCEP) guidelines. *Adults:* yearly. If abnormal, follow NCEP guidelines. Each focused visit Age > 40 years
Eye Care	• Dilated eye exam by an ophthalmologist or optometrist	*Type 1*: If age >10 yrs, within3-5 yrs of onset, then yearly *Type 2*: At diagnosis, then yearly or in alternate years at the discretion of the ophthalmologist or optometrist
Oral Health	• Oral health screening……..	Each focused visit; if dentate, refer for dental exam every 6 months (every 12 months if edentate)
Foot Care	• Inspect feet, with shoes and socks off..... • Comprehensive lower extremity exam.....	Each focused visit: stress need for daily self-exam Yearly
Pregnancy	• Assess contraception/discuss family planning/assess medications for teratogenicity • Preconception consult.....	At diagnosis & yearly during childbearing years 3 - 4 months prior to conception
Self Management Training	By diabetes educator, preferably a CDE • Curriculum to include the 10 key areas of the national standards for diabetes self-management education	At diagnosis, then every 6 - 12 months or more as indicated by the patient's status
Medical Nutrition Therapy	By a registered dietitian, preferably a CDE • To include areas defined by the American Dietetic Association's Nutrition Practice Guidelines	*Type 1**: At diagnosis, then, if age <18 years, every 3 - 6 months. If age >18 years, every 6 - 12 months *Type 2**: At diagnosis, then every 6 - 12 months; * Or > often as indicated by the patient's status.
Immunizations	• Influenza ..... • Pneumococcal……..	Per ACIP (Advisory Committee on Immunization Practices) Per ACIP

These guidelines were developed to provide guidance to primary care providers and are not intended to replace or preclude clinical judgement.

Patient Flow Sheet/Chart Audit Tool - Diabetes Mellitus - Detailed Format

Patient Name _____ ID _____ Birthdate _____/_____/_____

Check type of Diabetes:___ Type 1 ___ Type 2 ___ Gestational ___ Other Date of Diagnosis: _____/_____/_____ Home Glucose Monitoring: ___Yes ___No

Treatment: (check all that apply)_____Insulin _____Insulin & Oral Meds _____Oral Meds _____Diet _____ Physical Activity

Instructions: Please indicate <u>date of exam/test</u>, "A" for abnormal or "N" for normal <u>and the actual results</u>, when appropriate (eg. lab value), "D" if done elsewhere, and "R" if referred. Additional explanations should be written in the patient's clinical notes.

General Office Visits	date/results	date/results	date/results	date/results	date/results	date/results
Review management plan *Type 1:* every 3 months *Type 2:* every 3-6 months						
Review physical activity *each visit*						
Weight						
Height						
BMI						
Glycemic Control						
HbA1c test *every 3-6 months*						
Review HbA1c target goal *Every visit*						
Kidney Function						
Microalbuminuria *Type 1: begin with puberty or after 5 yrs duration, then yearly Type 2: at dx, then yearly*						
Creatinine clearance & protein *yearly after microalbumin >300mg/24 hrs.*						
ACE inhibitor therapy *if indicated*						
Cardiovascular						
Smoking status *each visit*						
Advised to quit smoking *each visit*						
Smoking cessation referral *If indicated*						
Lipid Profile *Children > age 2 yrs, after dx when in glycemic control; Adults: yearly*						
TG						
HDL						
LDL						
Blood pressure *each visit*						
Aspirin therapy *if indicated*						
Eye Care						
Dilated eye exam *Type 1: If age> 10 years, within 3-5 years of onset, then yearly Type 2: At diagnosis then yearly*						
Oral Health Care						
Oral health screening *each visit*						
Refer to dentist *every 6 months*						
Foot Care						
Inspect bare feet & stress self-exam *each visit*						
Comprehensive lower extremity exam *yearly*						
Pregnancy						
Assess contraception/discuss family planning/assess meds for teratogenicity *at diagnosis and yearly during childbearing years*						
Preconception consult *3-4 months prior to conception*						
Self Management Training						
At diagnosis, then every 6-12 months or more as indicated by the patient's status						
Medical Nutrition Therapy						
At diagnosis, then, Type 1: age <18, every 3-6 mos; age 18+, every 6-12 mos. or > as indicated *Type 2:* every 6-12 months or > as indicated						
Immunizations						
Influenza *yearly*						
Pneumococcal						

Patient Flow Sheet/Chart Audit Tool - Diabetes Mellitus - Brief Format

Patient Name _____ ID _____ Birthdate _____/_____/_____

Check type of Diabetes:___ Type 1 ___ Type 2 ___ Gestational ___ Other Date of Diagnosis: _____/_____/_____ Home Glucose Monitoring: ___Yes ___No

Treatment: (Check all that apply)_____Insulin _____Insulin & Oral Meds _____Oral Meds _____Diet _____ Physical Activity

Instructions: Please indicate date of exam/test, "A" for abnormal or "N" for normal and the actual results, when appropriate (eg. lab value), "D" if done elsewhere, and "R" if referred. Additional explanations should be written in the patient's clinical notes.

General Office Visits	date/results	date/results	date/results	date/results	date/results	date/results
Review management plan						
Review physical activity						
Weight						
Height						
BMI						
Glycemic Control						
HbA1c test						
Review HbA1c target goal						
Kidney Function						
Microalbumin						
Creatinine clearance & protein.						
ACE inhibitor therapy						
Cardiovascular						
Smoking status						
Advised to quit smoking						
Smoking cessation referral						
Lipid Profile						
TG						
HDL						
LDL						
Blood pressure						
Aspirin therapy						
Eye Care						
Dilated eye exam						
Oral Health Care						
Oral health screening						
Refer to dentist						
Foot Care						
Inspect bare feet & stress Self-exam						
Comprehensive lower extremity exam						
Pregnancy						
Assess contraception/discuss family planning						
Preconception consult						
Self Management Training						
Referral/visit						
Medical Nutrition Therapy						
Referral/visit						
Immunizations						
Influenza						
Pneumococcal						

DIABETES EYE EXAM CONSULTATION FORM

Patient: Please complete section A. Take this form to your eye care specialist when you go for your eye exam. Ask him/her to complete Section B. If you use a Personal Diabetes Care Record, other wallet card or other form to keep track of the dates and results of your diabetes exams, take this information with you and show it to your eye care specialist.

Section A. PATIENT INFORMATION

Patient Name:_____ Date of Birth___/___/___

Patient Address:_____

Patient Phone Number:_____

Name of Doctor or Primary Care Provider (PCP):_____

PCP Address:_____

PCP PhoneNumber: _____ PCP Fax Number: _____

Eye Care Specialist: Please complete section B. Mail or fax the form back to the PCP.

Section B. RESULTS OF DIABETES EYE EXAM

Exam date: ___/___/___ Were the patient's eyes dilated for this exam? ❒ yes ❒ no

- ❒ **No diabetic retinopathy**
- ❒ **Diabetic retinopathy requiring no treatment**
- ❒ **Diabetic retinopathy requiring treatment**
- ❒ **Other eye disease_____**
- ❒ **Report sent to patient's PCP**

Follow-up Recommendations:

Eye Care Specialist's Name:_____ Signature:_____

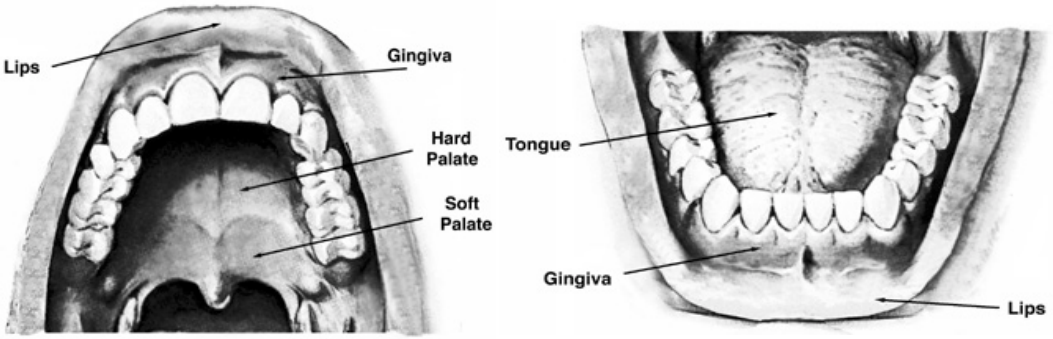
Address: _____

Phone Number:_____ Fax Number:_____

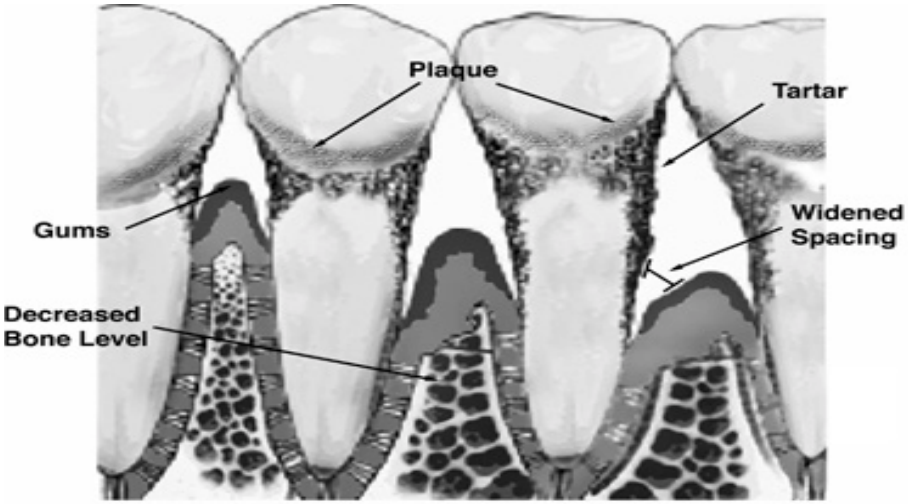
Please fax or mail the completed form to the patient's doctor or primary care provider. Thank you.

Diabetes Oral Health Screening Guide

Please perform an oral health evaluation at least every six months. The accompanying diagrams may be helpful for understanding the evaluation criteria and the presence of periodontal disease. Assign a score based on your findings and refer to a dentist for further evaluation if score is 4 or more.



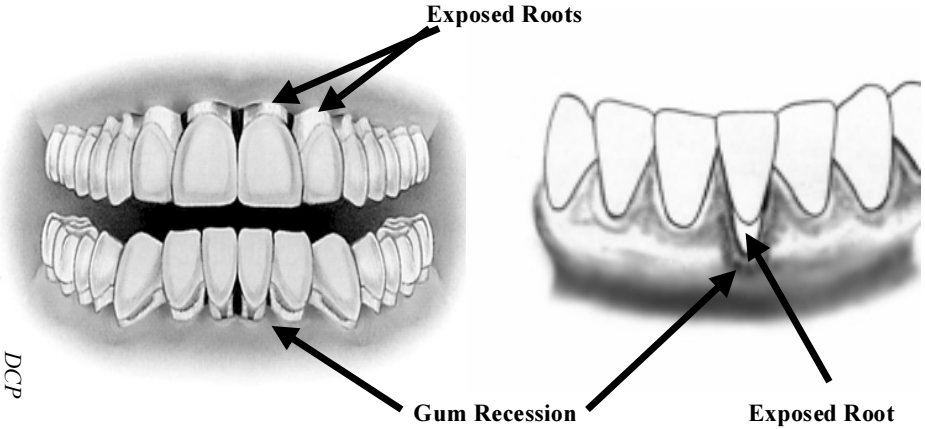
This picture represents a healthy mouth. The gums are resting firmly around the teeth and there are no exposed roots or visible debris on the teeth



Periodontitis is a chronic infectious disease that causes loss of tooth supporting bone and can lead to tooth loss.

Generalized Periodontal Disease

Localized Periodontal Disease



Diabetes Oral Health Screen

More than 6 months since last dental visit	4
Bleeding of the gums around teeth	4
Loose teeth	4
Visible debris or accumulation of hardened material around teeth	3
Exposed roots on any teeth	2
Strong odor in the mouth	1
Smoking or smokeless tobacco use	1
Total Score	

Refer for dental evaluation if total score is 4 or more

Annual Comprehensive Diabetes Foot Exam Form

Name: _____ Date: _____ ID#: _____

I. Presence of Diabetes Complications
1. Check all that apply.
❑ Peripheral Neuropathy
❑ Nephropathy
❑ Retinopathy
❑ Peripheral Vascular Disease
❑ Cardiovascular Disease
❑ Amputation *(Specify date, side, and level)*

_____

Current ulcer or history of a foot ulcer? Y____ N____

For Sections II & III, fill in the blanks with "Y" or "N" or with an "R," "L," or "B" for positive findings on the right, left, or both feet.

II. Current History
1. Is there pain in the calf muscles when walking that is relieved by rest? Y____ N____
2. Any change in the foot since the last evaluation? Y ____ N____
3. Any shoe problems? Y___ N____
4. Any blood or discharge on socks or hose? Y____ N____
5. Smoking history? Y___N___
6. Most recent hemoglobin A1c result _____% _____ *date*

III. Foot Exam
1. Skin, Hair, and Nail Condition
Is the skin thin, fragile, shiny and hairless? Y ___ N___

Are the nails thick, too long, ingrown, or infected with fungal disease? Y ___ N___

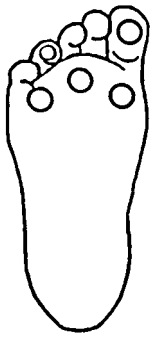
Measure, draw in, and label the patient's skin condition, using the key and the foot diagram below.
C=Callus U=Ulcer PU=Pre-Ulcer
F=Fissure M=Maceration R=Redness
S=Swelling W=Warmth D=Dryness

2. Note Musculoskeletal Deformities
❑ Toe deformities
❑ Bunions (Hallus Valgus)
❑ Charcot foot
❑ Foot drop
❑ Prominent Metatarsal Heads

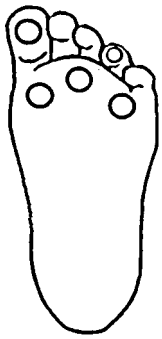
3. Pedal Pulses Fill in the blanks with a "P" or an "A" to indicate present or absent.
Posterior tibial Left_____ Right_____
Dorsalis pedis Left_____ Right_____

4. Sensory Foot Exam *Label sensory level with a "+" in the five circled areas of the foot if the patient can feel the 5.07 (10-gram) Semmes-Weinstein nylon monofilament and "-" if the patient cannot feel the filament.*

Notes



Right Foot



Left Foot

Notes

IV. Risk Categorization *Check appropriate box.*

❑ Low Risk Patient
All of the following:
❑ Intact protective sensation
❑ Pedal pulses present
❑ No deformity
❑ No prior foot ulcer
❑ No amputation

❑ High Risk Patient
One or more of the following:
❑ Loss of protective sensation
❑ Absent pedal pulses
❑ Foot deformity
❑ History of foot ulcer
❑ Prior amputation

V. Footwear Assessment *Indicate yes or no.*
1. Does the patient wear appropriate shoes? Y___ N ___
2. Does the patient need inserts? Y ___ N ___
3. Should corrective footwear be prescribed? Y ___ N ___

VI. Education *Indicate yes or no.*
1. Has the patient had prior foot care education? Y __N__
2. Can the patient demonstrate appropriate foot care? Y__N__
3. Does the patient need smoking cessation counseling? Y__N__
4. Does the patient need education about HbA1c or other diabetes self-care? Y__N__

VII. Management Plan *Check all that apply.*
1. Self-management education:
Provide patient education for preventive foot care. Date: _____
Provide or refer for smoking cessation counseling. Date: _____
Provide patient education about HbA1c or other aspect of self-care. Date: _____
2. Diagnostic studies:
❑ Vascular Laboratory
❑ Hemoglobin A1c (at least twice per year)
❑ Other: _____

3. Footwear recommendations:
❑ None
❑ Athletic shoes
❑ Accommodative inserts
❑ Custom shoes
❑ Depth shoes

4. Refer to:
❑ Primary Care Provider
❑ Diabetes Educator
❑ Podiatrist
❑ RN Foot Specialist
❑ Pedorthist
❑ Orthotist
❑ Endocrinologist
❑ Vascular Surgeon
❑ Foot Surgeon
❑ Rehab. Specialist
❑ Other: _____

5. Follow-up Care:
Schedule follow-up visit. Date: _____

Provider Signature _____

MANAGEMENT GUIDELINES*

Risk Category Defined	*Management Guidelines*
Low Risk Patients **All** of the following: • **Intact protective sensation** • **Pedal pulses present** • **No deformity** • **No prior foot ulcer** • **No amputation**	• Perform an annual comprehensive foot exam • Assess/recommend appropriate footwear. • Provide patient education for preventive self-care. • Perform visual foot inspection at provider's discretion.
High Risk Patients **One** or more of the following: **Loss of protective sensation** **Absent pedal pulses** **Foot deformity** **History of foot ulcer** **Prior amputation**	• Perform an annual comprehensive foot exam. • Perform visual foot inspection at every visit. • Demonstrate preventive self-care of the feet. • Refer to specialists and an educator as indicated. (Always refer to a specialist if Charcot foot is suspected.) • Assess/prescribe appropriate footwear. • Certify Medicare patients for therapeutic shoe benefits. • Place a "High Risk Feet" sticker on the medical record.

Management Guidelines for Active Ulcer or Foot Infection

- Never let patients with an open plantar ulcer walk out in their own shoes. Weight relief must be provided.
- Assess/prescribe therapeutic footwear to help modify weight bearing and protect the feet.
- Conduct frequent wound assessment and provide care as indicated.
- Demonstrate preventive self-care of the feet.
- Provide patient education on wound care.
- Refer to specialists and a diabetes educator as indicated.
- Certify Medicare patients for therapeutic footwear benefits.
- Place a "High Risk Feet" sticker on the medical record.

*Source: Feet Can Last a Lifetime: A Health Care Provider's Guide to Preventing Diabetes Foot Problems, November 2000, NDEP-2.

Use this copier-ready master to create your own stickers to place on the medical record. This master is designed to be reproduced on brightly colored 1" x 2-5/8" labels from Avery.

HIGH RISK
 FEET

HIGH RISK
 FEET

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Detach and reproduce for your practice

SHOES *and* SOCKS

take 'em off!

IF YOU HAVE DIABETES

Have your doctor check your feet.

MEDIAS *y* ZAPATOS

¡Sáqueselos!

SI TIENE DIABETES

Pídale a su médico que le vea los pies.

Essential Self-Management Training

Patient Name _____ MR/ID# _____ Type 1 ___ Type 2 ___ IGT ___ GDM ___

Instructions: Please indicate program skill level, teaching method, date and initials
Education evaluation key: 1 = needs instruction; 2 = needs review/assistance; 3 = verbalizes /demonstrates competence; N/A = not applicable.
Teaching Method: L = lecture/discussion; D = demonstration; AV =AV presentation; R = return demonstration; H = handout.

Topic/Outcome Verbalizes/demonstrates	Pre-Program code/init/date	Teaching (codes/initials/dates) Initial	 Reinforce	 Reinforce	Post-Program code/init/date	F/U needed & comments
A. Disease process and treatment options						
• Understanding of diabetes in simple terms & problems with high blood sugar						
• Contributing factors and symptoms						
• Type of diabetes, treatment plan and goals						
• Concept of self-care and treatment goals						
• Seriousness of disease and need for regular diabetes education updates and lifelong care						
B. Psychosocial adjustment to daily life						
• Acceptance of disease & affect on lifestyle						
• Effect of stress on BG & healthy coping skills						
• Need for a regular, ongoing system for medical care						
• Where to obtain information & support; knows community resources						
• Role of family or friend or significant other						
C. Nutritional management*						
• Nutrition goals & guidelines for nutrition therapy						
• Effect of timing & amount of food and type of nutrient/food on intake of BG levels						
• Nutrition Facts Labels & grocery shopping						
• Individual meal plan & how to use						
• CVD risk factors & how to reduce (lipids, BP)						
• Cooking & recipe modification techniques						
• Benefits & strategies for weight management						
• Safe use of alcohol						
• Use of meal plan for prepared food purchased away from home (restaurants, fast food, etc.)						
D. Physical activity						
• Benefits for diabetes control & general health						
• Appropriate types of activity & personal goals						
• Guidelines for a safe individualized activity plan						
• Hypoglycemia may occur during or after activity & need to carry a high CHO source (lists examples)						
• Guidelines for adjusting food plan to physical activity plans and test BG before, during, and after activity						

*denotes survival skills

(over)

Essential Self-Management Training, cont.

Patient Name _____ MR/ID# _____ Type 1 ___ Type 2 ___ IGT ___ GDM ___

Education evaluation key: 1 = needs instruction; 2 = needs review/assistance; 3 = verbalizes /demonstrates competence; N/A = not applicable.
Teaching Method: L = lecture/discussion; D = demonstration; AV =AV presentation; R = return demonstration; H = handout.

Topic/Outcome Verbalizes/demonstrates	Pre-Program code/init/date	Teaching (codes/initials/dates) Initial	 Reinforce	 Reinforce	Post-Program code/init/date	F/U needed & comments
E. Medication for therapeutic effectiveness*						
• Insulin name/dose/schedule/action/preparation/injection technique/onset/peak/duration/adjustment/side effects						
• safe storage of insulin & disposal of sharps						
• modification of food/insulin for activity/lifestyle changes, altered meal times, travel, holidays, shift changes						
• pattern management & insulin supplements						
• oral medication name/dose/ schedule/action/onset/peak/duration/side effects						
• concerns regarding OTC meds & dietary supplements						
F. Monitoring and use of results*						
Blood glucose						
• purpose and frequency of monitoring						
• accurate use of equipment and log, disposal of lancets, proper storage of strips and quality assurance measures						
• target BG range						
• adjustment of plan based on results & when to call team						
• need for HbA1c & why it is important						
• HbA1c test results and target goals						
Urine ketone testing						
• when, how, and why to test						
• when & how to contact the MD/diabetes team						
• guidelines for action for ketonuria						
G. Preventing, detecting & treating acute complications*						
Hypoglycemia						
• causes, signs, symptoms, treatment, prevention						
• alcohol is a risk factor for hypoglycemia						
• pros/cons of tight BG control & how to achieve						
• when & how to contact MD/diabetes team						
• carries CHO source at all times						
• has access to glucagon (prescription) support person taught_____						
• safe driving practices & need for medical ID use						
Hyperglycemia						
• causes, signs, symptoms, treatment, prevention						
• when/how to contact MD/diabetes team						
• relationship of DKA/HHNK to hyperglycemia						
General						
• effect of illness on BG & guidelines for sick day care						
• patient/family instructed in care of complications						
• need to wear & carry diabetes identification						

*denotes survival skills

Essential Self-Management Training, cont.

Patient Name _____ MR/ID# _____ Type 1 ___ Type 2 ___ IGT ___ GDM ___

Education evaluation key: 1 = needs instruction; 2 = needs review/assistance; 3 = verbalizes /demonstrates competence; N/A = not applicable.
Teaching Method: L = lecture/discussion; D = demonstration; AV =AV presentation; R = return demonstration; H = handout.

Topic/Outcome Verbalizes/demonstrates	Pre-Program code/init/date	Teaching (codes/initials/dates) Initial	 Reinforce	 Reinforce	Post-Program code/init/date	F/U needed & comments
H. Preventing, detecting & treating chronic complications						
• understanding of chronic complications, need for early detection, & prevention strategies (eye, foot, kidney, nerve, heart, oral problems, infections)						
• relationship of risk factors to complications (high BG, HTN, smoking, inactivity, diet, weight/BMI)						
• need for regular, ongoing visits to diabetes team						
• need for tests (HbA1c, lipids, microalbumin)						
• need for annual dilated eye (with drops in eyes)						
• need for regular dental visits & proper oral health care						
• need for annual comprehensive lower extremity exam						
• need to remove shoes/socks for foot exam at each medical visit						
• reasons for daily self-inspection of feet, S/S of potential problems & when to contact MD/team						
• how to do self-foot exam & routine foot care/foot wear						
• need for immunizations						
• proper skin care						
• s/s of infection						
I. Goal setting & problem solving						
• patient's role in prevention of complications						
• strategies for changing behaviors						
• personalized goals (BG, HbA1c, lipids, BP, nutrition, weight/BMI, physical activity, kidney function, smoking cessation, etc.)						
J. Preconception care/ pregnancy/gestational						
• (for pre-existing diabetes) need for pre-pregnancy counseling & good BG control prior to conception						
• relationship between BG control and pregnancy outcomes						
• risks of maternal and fetal complications						
• need for increased monitoring and care when pregnant						
• (for gestational) need for f/u testing for diabetes after pregnancy & need to reduce risk factors						

*denotes survival skills

Initials	Signature	Initials	Signature

Post Program Education Follow-up Plan:

_____

_____

_____Initials:_____Date:_____

Body Mass Index (BMI)

Adults

BMI has become the gold standard to assess overweight and obesity and to estimate the relative risk of disease due to excess weight. National obesity guidelines also recommend measurement of waist circumference to assess abdominal fat content as part of an obesity assessment. Evidence from epidemiological studies indicates that a high waist circumference is associated with an increased risk of type 2 diabetes, dyslipidemia, hypertension, and cardiovascular disease.

For adults, a BMI of 25 kg/m² or greater indicates overweight and 30 kg/m² or greater indicates obesity. For adult patients with a BMI of 25-34.9 kg/m², sex-specific waist circumference cutoffs should be used in conjunction with BMI to identify increased disease risks. Risk is increased with a waist circumference of > 35 inches in women and > 40 inches in men. BMI values apply to both men and women, regardless of age, frame, size, or muscle mass. Values do not apply to athletes and body builders, pregnant and nursing women, and frail, elderly persons.

A BMI chart for adults is included in this guideline appendix and is also available on the Internet at http://www.nhlbi.nih.gov/guidelines/obesity/bmi_tbl.htm.

Growth Charts and Body Mass Index-for-Age for Children & Adolescents

The Centers for Disease Control & Prevention has published new weight-for-stature and BMI charts for children and adolescents that are available through the Internet at http://www.cdc.gov/growthcharts. The BMI-for-age charts and instructions are available at http://www.cdc.gov/nccdphp/dnpa/bmi/bmi-for-age.htm. Charts are available for:

- infants birth to 36 months, which provide weight-for-age, length-for-age, weight-for-length, and head circumference-for-age percentiles
- children 2-6 years, which provides weight-for-stature percentiles.
- children and adolescents, 2-20 years, which provide weight-for-age, stature-for-age, and body mass index-for-age percentiles

For young children (age 2 years and over who are under 48 inches tall) either weight-for-stature or BMI can be used. For children over 48 inches tall and up to age 20 years, BMI needs to be used. BMI charts factor in the child's age. As children grow, their body fatness changes over time. In addition, girls and boys differ in their body fatness as they mature. Plot the BMI-for-age according to the sex-specific charts.

The following established cut-off points may indicate a health risk in children 2-20 years of age. In these cases, further medical assessment (including diet, physical activity, and laboratory measures) is recommended.

Underweight	BMI-for-age or weight-for-stature < 5th percentile
At risk for overweight	BMI-for-age or weight-for-stature ≥ 85th percentile
Overweight	BMI-for-age or weight-for-stature ≥ 95th percentile

References:

1. Clinical Guidelines on the Identification, Evaluation , & Treatment of Overweight & Obesity in Adults
2. Obesity guidelines: http://www.nhlbi.nih.gov/guidelines/obesity/ob_home.htm
3. Adult BMI charts: http://www.nhlbi.nih.gov/guidelines/obesity/bmi_tbl.htm
4. US Dept. of Health & Human Services, Centers for Disease Control & Prevention, CDC Table for Calculated Body Mass Index for Selected Heights and Weights for Ages 2-20 Years.

Body Mass Index (BMI) Table for Adults

To use this table, find the appropriate height in the left-hand column. Move across to a given weight. The number at the top of the column is the BMI at the height and weight. Pounds have been rounded off.

BMI	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**
Height													***Weight (in pounds)***														
4'10" (58")	91	96	100	105	110	115	119	124	129	134	138	143	148	153	158	162	167	172	177	181	186	191	196	201	205	210	215
4'11" (59")	94	99	104	109	114	119	124	128	133	138	143	148	153	158	163	168	173	178	183	188	193	198	203	208	212	217	222
5' (60")	97	102	107	112	118	123	128	133	138	143	148	153	158	163	168	174	179	184	189	194	199	204	209	215	220	225	230
5'1" (61")	100	106	111	116	122	127	132	137	143	148	153	158	164	169	174	180	185	190	195	201	206	211	217	222	227	232	238
5'2" (62")	104	109	115	120	126	131	136	142	147	153	158	164	169	175	180	186	191	196	202	207	213	218	224	229	235	240	246
5'3" (63")	107	113	118	124	130	135	141	146	152	158	163	169	175	180	186	191	197	203	208	214	220	225	231	237	242	248	254
5'4" (64")	110	116	122	128	134	140	145	151	157	163	169	174	180	186	192	197	204	209	215	221	227	232	238	244	250	256	262
5'5" (65")	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210	216	222	228	234	240	246	252	258	264	270
5'6" (66")	118	124	130	136	142	148	155	161	167	173	179	186	192	198	204	210	216	223	229	235	241	247	253	260	266	272	278
5'7" (67")	121	127	134	140	146	153	159	166	172	178	185	191	198	204	211	217	223	230	236	242	249	255	261	268	274	280	287
5'8" (68")	125	131	138	144	151	158	164	171	177	184	190	197	203	210	216	223	230	236	243	249	256	262	269	276	282	289	295
5'9" (69")	128	135	142	149	155	162	169	176	182	189	196	203	209	216	223	230	236	243	250	257	263	270	277	284	291	297	304
5'10" (70")	132	139	146	153	160	167	174	181	188	195	202	209	216	222	229	236	243	250	257	264	271	278	285	292	299	306	313
5'11" (71")	136	143	150	157	165	172	179	186	193	200	208	215	222	229	236	243	250	257	265	272	279	286	293	301	308	315	322
6' (72")	140	147	154	162	169	177	184	191	199	206	213	221	228	235	242	250	258	265	272	279	287	294	302	309	316	324	331
6'1" (73")	144	151	159	166	174	182	189	197	204	212	219	227	235	242	250	257	265	272	280	288	295	302	310	318	325	333	340
6'2" (74")	148	155	163	171	179	186	194	202	210	218	225	233	241	249	256	264	272	280	287	295	303	311	319	326	334	342	350
6'3" (75")	152	160	168	176	184	192	200	208	216	224	232	240	248	256	264	272	279	287	295	303	311	319	327	335	343	351	359
6'4" (76")	156	164	172	180	189	197	205	213	221	230	238	246	254	263	271	279	287	295	304	312	320	328	336	344	353	361	369

Source: Evidence Report of Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults, 1998. NIH/National Heart, Lung, and Blood Institute (NHLBI)
http://www.nhlbi.nih.gov/guidelines/obesity/bmi_tbl.htm

BMI of 25 or greater indicates OVERWEIGHT

BMI of 30 or greater indicates OBESITY

To calculate an adult BMI outside the range of the above chart, use one of the following formulas:

a) weight in pounds ÷ height in inches ÷ height in inches x 703 = BMI

b) weight in kilograms ÷ height in meters ÷ height in meters = BMI

Helpful Tools and Resources for Depression

Depression occurs more frequently in people with diabetes than in the general population, placing them at increased risk of complications and poor medical outcomes, such as worsened glycemic control. The good news is that depression is highly treatable. Early recognition of depressive symptoms and prompt referral for treatment of depression is essential.

Depression screening tools can help primary care practitioners identify individuals with depressive symptoms and help determine whether a referral for further evaluation and treatment is necessary. However, it is important to note that screening tools are not diagnostic tools. Some symptoms cannot be explained or discovered through a simple self-report questionnaire. Specific instructions for administration, scoring, and follow-up available for use with each tool should be followed.

Sample Depression Screening Tools

The HANDS ™ manual and screening tool, as well as permission for use may be requested through:
Harvard Department of Psychiatry/National Depression Screening Day Scale
One Washington Street, Suite 304, Wellesley Hills, MA 02481-1706
(781) 239-0071 or (781) 431-7447
http://www.nmisp.org and http://www.nmisp.org/dep/dep-hands.htm

Center for Epidemiological Studies Depression Scale - for children & adults - (no cost)
NIMH, 6001 Executive Blvd. Room 8184, MSC 9663, Bethesda, MD 20892-9663; (301) 443-4513

The Beck Depression Inventory (BDI) tool and manual (fee) - for children & adults
Psychological Corporation, 555 Academic Court, San Antonio, Texas 78204; (210) 299-1061

Children's Depression Inventory (CDI) tool and manual (fee)
Multi-Health Systems, 908 Niagra Falls Blvd., North Tonawana, NY 14120-2060; (800) 456-3003
A fact sheet on depression in children is available at: http://www.nimh.nih.gov/publicat/depchildresfact.cfm

Zung Self-Rating Depression Scale & instructions for use are available through your local Eli Lilly representative or by calling 1-800-LillyRx

Prime-MD Today, Evaluation of Mental Disorders & instructions for use are available through your local Pfizer representative

Additional resources

Shulberg HC, Katon W, Simon GE, Rush AJ, Treating major depression in primary care practice: An update of the Agency for Health Care Policy and Research Practice Guidelines, *Archives of General Psychiatry* 55, 1121-1127, 1998.

Garrard, Rolnick SJ, Nitz NM, et al, Clinical detection of depression among community-based elderly people with self-reported symptoms of depression, *Journal of Gerontology: Medical Sciences* 53A (3), M92-M101, 1998. (This study used the Geriatric Depression Scale (GDS) in primary care settings).

Wells KB, Sherbourne C, et al, Impact of Disseminating Quality Improvement Programs for Depression in Managed Primary Care: A Randomized Controlled Trial, *JAMA*, 283: (2), 212-220, 2000.

Contact the **National Institute of Mental Health** at 301-443-4513 or search NIMH's home page: www.nimh.nih.gov.

Frequently Asked Questions

Frequently Asked Questions - Essential Diabetes Mellitus Care Guidelines
Wisconsin Diabetes Advisory Group
April 2001

The supporting evidence and the rationale for all areas of concern for these Essential Diabetes Mellitus Care Guidelines are delineated within the supporting document and reference sections of the full-text document. You may view, print, or download copies via the Internet at http://www.dhfs.state.wi.us/health/diabetes/DBMCGuidelns.htm or you may request copies from the Wisconsin Diabetes Control Program. Call (608-261-6871), e-mail (zapppa@dhfs.state.wi.us), or write to the Wisconsin Diabetes Control Program at PO Box 2659, Madison, WI 53701-2659.

Q: Who developed these guidelines?

A: They were developed through a collaborative effort of the Wisconsin Diabetes Advisory Group, a statewide group of over 55 key organizations involved in diabetes care. Countless other individuals were also involved in the review and revision of various drafts during development. The Wisconsin Diabetes Control Program facilitated the process.

Q: How were the guidelines developed?

A: The first meeting of the Diabetes Advisory Group was held in December 1996. At that time a decision to develop state guidelines as a way to improve diabetes care in Wisconsin was defined as a priority. National figures revealed that, in spite of the availability of already existing guidelines (American Diabetes Association), there are wide gaps between current recommendations for care and actual practice. Most people with diabetes do not receive recommended levels of preventive care. Research also shows that adoption of locally developed guidelines is a growing feature in many health care practices and has shown to offer a useful opportunity to improve care. The advisory group members approached the guideline challenge with enthusiasm and developed several drafts that were shared widely for critique and input. Opinions were sought from additional experts as well as groups who would be ultimately impacted by these guidelines. The advisory group achieved consensus on the guidelines and unanimously approved them in the spring of 1998. During 2000 the workgroup reconvened to update the original guidelines and followed a similar course of action to gain input and support. Implementation efforts are now underway to incorporate the guidelines into practice throughout Wisconsin.

General Recommendations

Q: Do these guidelines imply the frequency of visits that must be made for all patients with diabetes or is it up to the organization or judgment of the provider? Is there any flexibility for patients who are in good glycemic control?

A: The guidelines are intended to be just that - guidelines. They are based on available literature and good practice standards and are intended to insure that patients with diabetes receive appropriate care, to reduce both the need for emergency care and the risk of chronic complications of the disease. No practitioner is expected to maintain this level of care single-handedly; the establishment of a "diabetes team" comprised of the primary care provider, diabetes educators, dietitians, pharmacists, and other medical specialists can be extremely useful in providing care for the patient with diabetes. We recommend quarterly "dedicated" diabetes visits with the provider to assess the patient's glycemic control and for complication surveillance. Quarterly, or even more frequent visits should be maintained for those patients using insulin, for those whose control is less than optimal, and for those whose degree of progression of complications warrants more in-depth assessment and treatment. For those patients

who have minimal medication requirements and who maintain excellent glycemic control (HbA1c <7.0%), visits can be reduced to every 4 to 6 months at the discretion of the patient's provider.

Q: What is insulin resistance?

A: Insulin resistance occurs when the normal amount of insulin secreted by the pancreas is not able to control blood glucose levels. To compensate, the pancreas secretes additional insulin. When the body's cells resist or do not respond to the high levels of insulin secreted in insulin resistance, glycemic control is compromised and type 2 diabetes can develop.

In addition, insulin resistance is often accompanied by dyslipidemia. Elevated triglyceride levels with low levels of HDL cholesterol are common and contribute to increased heart disease risk. *Syndrome X*, or the Metabolic Syndrome, is a term used to describe the cluster of risk factors often accompanying insulin resistance. These include hypertriglyceridemia and low HDL as mentioned, as well as hyperinsulinemia, hyperglycemia and hypertension.

Physical inactivity and obesity, especially abdominal obesity, contribute to the development of insulin resistance. Moderate weight loss (10-20 pounds) can significantly improve insulin resistance.

Glycemic Control

Q: Is monitoring fructosamine levels also acceptable to assess long term glycemic control?

A: Fructosamine, or glycated serum proteins, reflects changes in glycemic control over 1 or 2 week periods. Fructosamine may be useful to detect more short-term changes in glycemic control and to assess control where HbA1c values may not be accurate (hemoglobinopathies). Measurement of fructosamine, however, has not been demonstrated to correlate with the risk of development of complications, as has HbA1c, and should not be considered equivalent to measurement of HbA1c.

Kidney Function

Q: Why is a routine urinalysis recommended?

A: An initial UA should be done to look for glucose, ketones and protein. If protein is present, then a 24-hour collection for quantitative protein & creatinine clearance should be done to thoroughly evaluate renal function. If negative, a urine microalbumin should be done to look for microalbuminuria, which represents early diabetic nephropathy and can be treated with ACE-inhibitors and glucose control. The recommendation for a yearly UA should be based on the patient. It probably doesn't add much to well-controlled patients without kidney disease. It is useful in patients with recurrent asymptomatic urinary tract infections (usually due to atonic bladder as a complication of diabetic neuropathy).

Q: Is a urine "dipstick" sufficient to assess urine protein?

A: A urine dipstick is not adequate as a screening test, since it does not detect microalbuminuria. If the dipstick is positive (on at least 2 samples), the patient will already have microalbumin >300 and needs to be evaluated as stated above. Urine microalbumin can be done on a random (or spot) specimen or on a timed collection. Most accurate measures are albumin excretion rate (done on a timed sample) or microalbumin:creatinine ratio done on a spot sample.

Q: What tests are recommended for follow-up of microalbuminuria?

A: If microalbumin testing is positive (between 30-300), the test should be confirmed with a second sample. If still elevated, ACE-I therapy should be started. It is recommended to repeat the test again in 3-6 months to see the effects of the ACE-I. The ACE-I dose should be increased as tolerated until microalbumin is normalized (or as near as possible).

If microalbumin is >300 mg, a 24 hour urine for protein and creatinine clearance should be done to more fully evaluate renal function. Begin ACE-I (if not already on it) and repeat as necessary until proteinuria is decreased as much as possible. Repeat yearly to get an estimate of the rate of decline of renal function, which is useful in predicting time to renal failure/dialysis/transplant.

Q: Does testing for urine microalbumin need to be performed if albumin has previously been found in the urine?

A: Once urine albumin exceeds 300mg/24 hours, we recommend that a 24-hour urine collection specimen be obtained for determination of creatinine clearance and protein on a yearly basis. Lesser degrees of albuminuria should be confirmed, as certain medications, especially NSAIDs, and physical activity can transiently worsen microalbuminuria. We do recommend yearly determinations of creatinine clearance and protein in patients with gross albuminuria, even if already treated with angiotensin converting enzyme inhibitors, both to assess for stability or deterioration in renal function, and to determine if ACE inhibitor therapy is effective.

Q: Has ACE inhibitor therapy been proven to be effective for patients with nephropathy and type 2 diabetes?

A: The preponderance of evidence of effects of ACE inhibitors to renal function has been compiled for patients who have nephropathy and type 1 diabetes. There are, however, a number of studies that indicate a beneficial effect of ACE inhibitors in treatment of nephropathy in patients with type 2 diabetes. We do not know whether ACE inhibitors *prevent* nephropathy in patients with type 2 diabetes, and one could argue that control of hypertension with any antihypertensive agent would be of benefit, but the available evidence favors use of ACE inhibitor therapy in patients with nephropathy and type 2 diabetes. Both ACE inhibitors and Angiotensin II blocking agents are contraindicated in pregnancy.

Cardiovascular Health

Q: Is there good evidence to support aspirin prophylaxis for women with diabetes?

A: Aspirin therapy is beneficial for both men and women with diabetes for coronary artery disease prophylaxis. Women with diabetes have an incidence of coronary artery disease approximately equal to that of men in the general population. Women with coronary artery disease tend to be diagnosed later, and have higher morbidity associated with their disease than do men. Incidentally, aspirin, when used in prophylactic doses (in both men and women), does not increase the risk of retinal hemorrhage. As coronary artery disease is the leading cause of death in patients with type 2 diabetes, and is the second most frequent cause of death in patients with type 1 diabetes, we recommend aspirin prophylaxis for all patients with diabetes over the age of 40 years, unless otherwise contraindicated. For patients with significant risk factors for coronary disease (nephropathy, dyslipidemia, family history of CAD, smoking, and longstanding diabetes), we recommend initiating aspirin therapy at age 30 years.

Q: Is annual lipid testing necessary if the patient's initial profile has ideal levels?

A: Determination of lipid levels depends on the patient's age, initial values, and glycemic control. We recommend following the 1993 National Cholesterol Education Program guidelines. Children over the age of 2 years should be tested after the diagnosis of diabetes and once reasonable glycemic control has been established. If values are acceptable, children should be retested at least every 5 years. If abnormal, testing should be done annually. Since aging, glycemic control, weight change and medications can affect lipid levels, we recommend determination of lipid levels annually for adults with diabetes.

Q: Why is the LDL cholesterol goal so low (100 mg/dL)? How can we help patients achieve this level?

A: Several recent studies, including the 4S Trial, the West of Scotland Study, and the CARE Trial, have demonstrated the beneficial effects of LDL cholesterol reduction on morbidity and mortality from coronary artery disease. LDL cholesterol reduction is particularly helpful for patients with diabetes. Coronary artery disease is the leading cause of death in patients with type 2 diabetes and is second only to renal disease as the cause of death in patients with type 1 diabetes. With advances in renal transplantation, coronary artery disease may surpass end stage renal disease as the leading cause of death in patients with type 1 diabetes. Due to the high risk for coronary heart disease resulting from type 2 diabetes, the National Cholesterol Education Program (NCEP) indicates that aggressive lowering of LDL cholesterol levels, similar to that recommended for established coronary heart disease can be applied to patients with diabetes. While NCEP does not specifically address the issues of LDL cholesterol reduction in patients with type 1 diabetes, given the high incidence of coronary artery disease in patients with type 1 diabetes, we recommend attempting to achieve comparable (ideal) levels for patients with type 1 diabetes as those for type 2 diabetes.

Strategies to reduce LDL cholesterol include dietary modification, physical activity, weight loss, and lipid lowering medications. Generic niacin is relatively contraindicated for patients with type 2 diabetes because it may worsen hyperglycemia. Newer, long acting Niacin preparations (Niaspan) may have less impact on glycemic control. Patients treated with Niacin agents should be monitored frequently to determine the effectiveness of lipid therapy vs glycemic control. Bile acid sequestrants can worsen hypertriglyceridemia. Many patients will require initiation of drug therapy, usually with HMG CoA reductase inhibitors to achieve recommended levels of LDL cholesterol. A team approach, utilizing a diabetes educator, dietitian, and others is beneficial to provide follow-up necessary to help patients achieve and maintain the lifestyle changes needed for them to control their disease.

Q: Should beta-blocking agents be used in patients with diabetes?

A: Many physicians are reluctant to prescribe beta-blocking agents for patients with diabetes because of the possible adverse effects of beta-blockade on lipid metabolism and the potential for masking symptoms of hypoglycemia. However, the judicious use of selective (beta-1) blocking agents will usually minimize these side effects and provide significant benefit to people with diabetes who have known coronary artery disease. Several large studies have demonstrated that beta-1 selective blocking agents reduce post-MI cardiovascular mortality by 30-40% in patients with diabetes and are well tolerated. Beta blockade may also be added to ACE inhibitors for difficult to control hypertension, especially in patients with diabetes who have underlying coronary artery disease.

Q: How should elevated triglyceride levels be managed in patients with diabetes?

A: Elevated triglyceride levels (TG) and reduced HDL levels are a common form of dyslipidemia in patients with diabetes. This pattern occurs due to excess production and slow removal of TG-rich, very low density lipoproteins, especially following high carbohydrate meals. These TG-rich particles also interact with HDL particles causing a loss of HDL cholesterol content. Achievement of optimum glycemic control along with diet and exercise will sometimes decrease TG by 50-100 mg/dl. Treatment with "statin" class of drugs will often produce a simultaneous lowering LDL cholesterol and TG, and increase HDL cholesterol. If TG levels remain elevated (200-400 mg/dl), Niaspan or gemfibrozil may be added. Generic niacin and bile sequestrants will raise TG levels and should be avoided. *Detailed guidelines for management of dyslipidemias are available from the University of Wisconsin Medical Foundation, Preventive Cardiology Program #5750, 600 Highland Ave, Madison WI 53792-0001, phone 608-263-8730.*

Eye Care

Q: Are non-dilated fundus photo exams sufficient to screen for retinopathy?

A: No. Fundus photos of any type are not a substitute for a dilated fundus exam. A dilated fundus exam implies a comprehensive eye exam, which is more than just a good look at the retina. A comprehensive eye exam includes evaluation of 12 elements of the eye exam plus refraction. Evaluation of the fundus through a dilated pupil (by fundus biomicroscopy) is just one of the 12 elements. For areas with limited access to qualified experts, fundus photos are better than doing nothing to screen for retinopathy, however, this should not be the case in Wisconsin.

Non-dilated fundus photography is not a new technology. This type of photography is not as reliable as the seven standard field photography for detecting retinopathy. Ophthalmic fundus photography is not a substitute for a dilated fundus exam.

Oral Health

Q: Are people with diabetes more susceptible to the development of severe periodontitis?

A: Collectively, the scientific evidence supports a relationship between the two diseases, especially in patients with poorly controlled diabetes and hyperglycemia. Patients with diabetes have increased susceptibility to oral infections, including periodontitis. Periodontitis occurs with greater frequency and increased severity when other systemic complications of diabetes are more advanced. This increased susceptibility does not correlate with dental plaque or calculus levels. Among patients with insulin dependent diabetes, the risk for periodontitis positively correlates with duration of diabetes. Patients with non-insulin dependent diabetes are 2.8 times more likely to have periodontal attachment loss and 3.4 times more likely to have periodontal bone loss than people without diabetes are. In 1993, periodontal disease was recognized by *Diabetes Care* as the sixth complication of diabetes.

Q: Can elimination of periodontal infection improve glycemic control?

A: The presence of infections, including advanced periodontal disease, can increase insulin resistance and contribute to a worsening of diabetic control. Oral infections have been documented to be on occasion life threatening to patients with diabetes. Research has shown that insulin requirements are reduced in some insulin dependent subjects following periodontal therapy. In a recent prospective study of 88 NIDDM subjects aged 18-67 years, severe periodontitis at baseline was associated with poor glycemic control, defined as HbA1c of 9% or more, at follow-up. In this same population, elimination of periodontal infection and reduction of periodontal inflammation resulted in a significant reduction in the concentration of glycated hemoglobin (HbA1c). We generally recommend that a periodontal

examination is indicated following diagnosis for diabetes, and subsequent treatment for periodontal disease to improve control.

Medical Nutrition Therapy

Q: Is medical nutrition therapy necessary every 6-12 months for patients who are meeting glycemic and management goals?

A: Nutrition therapy is a cornerstone of management for diabetes. It was a critical component of the DCCT model for tight control in the achievement of improved HbA1c levels. Early intervention and ongoing nutrition therapy at the recommended levels are essential to help patients achieve glycemic control and reduce the risk of cardiovascular disease. Regular visits to dietitians provide the message that nutrition therapy is a necessary component of diabetes control. Ongoing visits for updates, support, education, and follow-up are critical to help patients attain and maintain the necessary lifestyle changes to control their disease. If providers choose to decrease visits for patients with no problems, who are *truly* stable and achieving *all* metabolic goals, they should refer the patient back to the dietitian at the first sign of *any* deterioration in control. The old model, waiting to refer to the dietitian *after* the patient is *out of control*, is not satisfactory.

Continuous Quality Improvement Guidelines

Continuous Quality Improvement Guidelines: Diabetes Mellitus

Assumptions: You have individuals or workgroups within your health system who have an interest in improving care for people with diabetes. Depending on your resources, you may wish to convene, or may already have in place, a specific multi-disciplinary diabetes workgroup committed to implementing a quality improvement project. You have administrative support from your health system prior to beginning work to assure adequate allocation of staff time and resources.

Action steps for diabetes quality improvement committees: Quality improvement committees rely on step-by-step methodologies to define a series of factors that occur systematically and result in improved care. The following *Continuous Quality Improvement Guidelines - Diabetes Mellitus,* developed in conjunction with the *Essential Diabetes Mellitus Care Guidelines for Wisconsin,* may be adopted or adapted to meet your health system's needs.

STEP 1. **Identify your population with diabetes**. You may already have a registry based on administrative/claims, encounter, hospitalization, and pharmacy data. This identification will allow you to more easily track pertinent clinical data by accessing information collected in the registry. Comparison and analysis of information collected will enable you to measure changes in health care status and evaluation of outcomes of care. The registry can be the basis for development of a tracking system to recall individuals for recommended care and facilitate targeting of high-risk groups of individuals for specific interventions. A designated individual should be responsible for maintaining and updating the registry to keep it current.

STEP 2. **Become familiar with these guidelines.** They consist of several components: The *essential diabetes mellitus care guidelines* outline 10 key areas of concern with recommendations for care/tests, along with a schedule of how frequent the care/test should be performed. *Supporting documents* and *references* provide additional details for each specific area of concern. These *continuous quality improvement guidelines* outline basic steps for implementation of a diabetes quality improvement project. The CQI guideline includes *population-based indicators* that correspond to the 10 key areas of concern in the *essential diabetes mellitus care guidelines,* as well as identification of possible sources for this data. Measurement with these indicators will help to evaluate overall diabetes care within health systems. Several sample *audit and flow chart* tracking forms which can simplify the data collection process are included.

STEP 3. **Review the essential diabetes mellitus care guidelines and the continuous quality improvement guidelines with your diabetes workgroup**. A process of local review and adoption is essential. Obtain provider endorsement of the guidelines, either as they exist or with system-specific changes necessary for your health system. This will result in improved consistency and quality of care throughout your system of care. The guidelines also serve as a reference point for improving the delivery of care and for measuring improvements in care over time.

STEP 4. **Clarify measurement issues and review criteria**. Select your topic and decide how you will collect baseline information. Give priority to indicators that are easiest to obtain and for which data are currently available within your health system (such as from existing databases). For example, information related to process measures, such as the percentage of patients who have had a dilated eye exam and the percentage of patients with lipid testing in the past year can be obtained from administrative data. Medical record review will likely be necessary for clinical outcome indicators, such as the percentage of patients with HbA1c below 8%. If chart reviews are required, determine how the charts will be selected.

It is essential to develop a set of review criteria that will allow you to translate the guidelines into measurable terms. Keep the criteria simple, concise, and objective. Define the terms that must be present in the record or from claims or other data to verify adequate fulfillment of each indicator (e.g., the date and results of lipid testing must be documented in the medical record or in a computerized data base). You also need to determine who in your health system is qualified to provide for various aspects of care, such as dilated eye exams, diabetes education, or nutrition therapy.

You will need to develop a data collection tool to document and track data elements for retrieval and analysis and to ensure consistency of data collection. A sample data collection tool, the *patient flow sheet/chart audit tool*, is included in this guideline packet. Provide training on use of your data collection tool to ensure that everyone understands the form, definitions of the criteria, and how to locate the information.

STEP 5. **Collect baseline data**. Conduct the administrative database review or the medical record review. You may wish to collect data for patients who have been *continuously* enrolled in the health care system for the previous 12 months (or the duration of your designated reporting period). Collecting data through a computerized database may be more efficient than chart audit and can help analyze the information as well as support tracking and recall. This will help provide consistency of data collection, which is essential.

STEP 6. **Analyze baseline data** to determine how your current practice compares with the guideline recommendations to identify problems in care that need improvement. The initial data will provide a reference point that will allow you to measure your progress and isolate problems when making future comparisons. Data should be presented to the medical staff, quality improvement committee, administrative and any other pertinent staff for discussion and feedback and used to convince policy makers of the need to improve health outcomes, efficiency, and accountability.

STEP 7. **Set priorities on what you want to change first, based on the identified problem areas.** Focus your project by selecting one or more areas for improvement. Avoid the temptation to try to fix everything at once. ***Adopt a goal that is a reasonable and achievable level*** for the population of people with diabetes for your health system.

STEP 8. **Design strategies for improving performance on the identified problem areas.** Choose approaches that have the greatest potential for impact and those that are more easily achieved. You will need to delineate the process of care associated with each problem to help discover the root causes for suboptimal care. Examples of how to design process of care diagrams can be found in various continuous quality improvement reference sources. Problem areas may exist at the level of the patient (e.g., a "no-show" for scheduled eye exam appointment), the provider (e.g., the provider does not order a HbA1c test or other recommended tests), or the system (e.g., no tracking system is in place for preventive screenings, so the date of the last foot exam is not available to the provider).

Develop strategies in consultation with medical and clinical staff who provide the day to day care and who will be personally involved and instrumental in implementation of a systematic process for change. Infrastructure, policy, and environmental changes, such as practice redesign or changes to support practitioners in the delivery of care offer the greatest potential to improve care system-wide. Some examples include: development of systems to support data collection to monitor performance and provide feedback to providers and patients (e.g., regarding abnormal tests or lab values to identify high risk patients); use of computerized or manual reminder systems to provide prompts for proactive care and support recall; use of flow sheets to standardize documentation; automatic referrals for labwork, exams, education, and nutrition; promotion of diabetes clinic teams and case management; access to consultation with subspecialists, educators,

dietitians, and pharmacists; development of standardized protocols to maximize efficiency and consistency of care; telephone support for patients between visits; patient and provider education; increased use of ancillary staff; and enhanced financial coverage for special services.

Identify a plan of action for implementation, set goals for improvement, assign responsibilities for specific tasks, and provide training in overall implementation strategies as needed.

STEP 9. **Implement strategies for improvement**. This will require the support and involvement of many individuals within your system. To gain their support and assistance, you will need to share the plan with the diabetes team, the medical staff, clinic staff, patients, and others at every level within the health system that will be involved with and affected by the plan. Assure that everyone understands his/her role as part of a team effort to improve diabetes care throughout the system. Ongoing communication and frequent feedback concerning the implementation process are essential.

STEP 10. **Measure your progress and evaluate the success of your interventions**. Using the baseline data for comparison, collect and summarize progress information to share with all staff involved. Celebrate areas of success and identify any continued concerns within the identified problem area. You may need to either revise data elements so that they measure the impact of your strategies or revise the strategies themselves to enable your health system to achieve its goals. Continue to monitor the improved process to maintain the progress achieved.

STEP 11. **Quality improvement is a continuous process**. Once you have achieved your goals for your initial problem area, continue the ongoing process by selecting other problems for improvement.

Special note**:** *For additional information and guidance on the overall quality improvement process, you may wish to consult additional resource guides or local quality improvement experts within your health system or community.*

QUALITY IMPROVEMENT RESOURCES:

1. Scholtes P, *The Team Handbook: How to use teams to improve quality*, Joiner Associates, Inc., 1989.
2. Brassard, Michael, *The Memory Jogger Plus +*, GOAL/QPC, 1996.
3. *An Introduction to Quality Improvement in Health Care*, Oakbrook Terrace: Joint Commission on Accreditation in Healthcare Organizations, 1991.
4. Crosson F, Why Outcomes Measurement Must be the Basis for the Development of Clinical Guidelines, *Managed Care Quarterly*, 3 (2):6-11, 1995.
5. Mosser G, Clinical Process Improvement: Engage First, Measure Later, *Quality Management in HealthCare*, 4 (4), 11-20, 1996.
6. Handley M, Stuart M, Kirz H, An Evidence-Based Approach to Evaluating and Improving Clinical Practice: Implementing Practice Guidelines, *HMO Practice*, volume 8, #2, 78-83, June 1994.
7. Gottlieb L, Sokol HN, Murrey K, Schoenbaum S, Algorithm-Based Clinical Quality Improvement, Clinical Guidelines and Continuous Quality Improvement, *HMO Practice*, volume 6, #1, 5-12.
8. Collins K, Quinlan A, Farrell M, Snyder LM, Influencing physician behavior with CQI: A case study, *Quality Management in Health Care*, 2(3), 27-35 1994.
9. Murrey K, Gottlieb L, Schoenbaum S, Implementing Clinical Guidelines: A Quality Management Approach to Reminder Systems, *Quarterly Review Bulletin, Journal of Quality Improvement*, 18(12), 423-433, 1992.
10. Woolf S, Jonas S. Lawrence, Health Promotion and Disease Prevention in Clinical Practice, Williams & Wilkins, 1996.
11. Kaluzny A, Konrad T, McLaughlin C, Organizational Strategies for Implementing Clinical Guidelines, *Journal on Quality Improvement*, 21 (7), 347-351.
12. Wagner E, Population-based management of diabetes care, *Patient Education and Counseling*, 26, 225-230, 1995.

Essential Diabetes Mellitus Care Guidelines
Population-based Indicators

Data sources include: medical record - MR, Administrative data/Claims - AD/C, Pharmacy - Ph, lab - L, or patient survey - PS

A health system should begin measurement with a *reasonable number* of indicators.

For guidance with measurement of these indicators, please refer to the companion resources "*continuous quality improvement guidelines - diabetes mellitus*", the "*essential diabetes mellitus care guidelines*," *supporting documents,* and *sample data collection tools.* They are intended to be used concurrently.

SHORT TERM INDICATORS Report % of patients within the applicable diabetes population with:	FREQUENCY	DATA SOURCE
GENERAL		
Diabetes-focused visits (Type 1)	4 or > per yr	MR - AD/C - PS
Diabetes-focused visits (Type 2)	2 or > per yr	MR - AD/C - PS
Physical Activity/Weight/BMI/Growth	each focused visit	MR
GLYCEMIC CONTROL		
Review for hypoglycemic episodes	Each focused visit	MR - PS
HbA1c - tests	2 or > per yr	AD/C - L
HbA1c - value	7.0 or <	L - MR
	> 8 .0	L - MR
KIDNEY FUNCTION		
Quantitative microalbuminuria	Yearly	AD/C - L - MR
Patients with microalbuminuria on ACE inhibitors		Ph - L - MR
Creatinine clearance/protein if microalbuminuria > 300mg/24 hr		AD/C - L - MR
CARDIOVASCULAR		
Smokers advised to quit	Each visit	MR - PS
Referral to cessation		MR - PS
Lipid profile	Yearly	AD/C - L - MR
Blood pressure	Each visit	MR - PS
Aspirin therapy for patients over age 40 years		Ph - MR - PS
EYE CARE		
Dilated eye exam	Yearly Alternate year	AD/C - MR - PS
ORAL HEALTH		
Oral health screening	Each focused visit	MR - PS
Dental referral	Every 6 months	MR - PS
FOOT CARE		
Foot exam without shoes & socks	Each focused visit	MR - PS
Comprehensive lower extremity exam	Yearly	MR - PS
PREGNANCY		
Family planning consult for childbearing age women	Yearly	MR - PS
Preconception consultation for childbearing age women		MR - PS
SELF MANAGEMENT TRAINING		
Education visits	1 or > per year	MR - PS
NUTRITION THERAPY		
Nutrition therapy visits (Type 1)	2 or > per year	MR - PS
(Type 2)	1 or > per year	MR - PS
IMMUNIZATIONS		
Influenza	Yearly	AD/C - MR - PS
Pneumococcal		AD/C - MR - PS

Essential Diabetes Mellitus Care Guidelines
Population-based Indicators

Data sources include: medical record - MR, Administrative data/Claims - AD/C, Pharmacy - Ph, Lab - L, or Patient survey - PS

A health system should select a *reasonable number* of the indicators for measurement.

INTERMEDIATE INDICATORS **Report % of patients within the applicable diabetes population with:**	**DATA SOURCE**
HbA1c 7.0 or < > 8.0 Mean HbA1c	L - AD/C -MR L - MR
Microalbuminuria Albuminuria	L - MR L - MR
LDL < 100 mg/dL LDL < 130 mg/dL HDL > 45 mg/dL Triglycerides < 200 mg/dL	L - MR
ER visits for: * severe hypoglycemia Hospitalizations for: * DKA * Other diabetes-related	AD/C - MR AD/C - MR
Blood pressure < 130 systolic Blood pressure < 80 diastolic	MR
Tobacco users	MR - PS
Smokers who quit	MR - PS
Influenza	AD/C - MR - PS
Pneumococcal pneumonia	AD/C - MR - PS
Infected lower extremity ulcers	A/C - MR
Other infections, periodontitis, oral, UTI, skin, etc.	AD/C - MR
Pregnancies complicated by: * major congenital malformations * macrosomia (> 4000 grams) * stillbirth or spontaneous abortion	 AD/C - MR - PS AD/C - MR AD/C - MR - PS

LONG TERM INDICATORS **Report % patients within the diabetes population with:**	**DATA SOURCE**
Proliferative retinopathy	AD/C - MR
Overt nephropathy	AD/C - MR
Cardiovascular disease	AD/C - MR
Myocardial infarction	AD/C - MR
Cerebrovascular disease	AD/C - MR
Other smoking related diseases (COPD, lung cancer, etc.)	AD/C - MR
End stage renal disease	AD/C - MR
Blindness	AD/C - MR
Lower extremity amputation	AD/C - MR
Osteomyelitis	AD/C - MR
Periodontal disease	AD/C - MR
Tooth loss	MR-PS

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